ADULT LITERACY FUNDAMENTAL MATHEMATICS

Book Three

ABE

ADULT BASIC
EDUCTATION

Adult Literacy Fundamental Mathematics

Book 3

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Based on the work of Leslie Tenta (1993) and Marjorie E. Enns (1983)

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Canadian Cataloguing in Publication Data

Downloading Information

http://urls.bccampus.ca/abefundmath3

ISBN 978-0-7726-6302-3
Adult Literacy Fundamental Mathematics Book 1

ISBN 978-0-7726-6303-0
Adult Literacy Fundamental Mathematics Book 2

ISBN 978-0-7726-6304-7
Adult Literacy Fundamental Mathematics Book 3

ISBN 978-0-7726-6305-4
Adult Literacy Fundamental Mathematics Book 4

ISBN 978-0-7726-6306-1
Adult Literacy Fundamental Mathematics Book 5

ISBN 978-0-7726-6307-8
Adult Literacy Fundamental Mathematics Book 6

ISBN 978-0-7726-6347-4
Adult Literacy Fundamental Mathematics, Instructor's Manual and Test-Bank

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To the Learner:

Welcome to Fundamental Mathematics Book One.

Adult Math Learners

You have the skills you need to be a strong student in this class.

Adult math learners have many skills. They have a lot of life experience. They also use math in their everyday lives. This means that adult math learners may already know some of what is being taught in this book. Use what you already know with confidence!

Grades Record

You have also been given a sheet to write down your grades. After each test, you can write in the mark. This way you can keep track of your grades as you go through the course. This is a good idea to use in all your courses. You can find this grade sheet at the end of the book.

How to Use this Book

This textbook has:

- ✓ A **Table of Contents** listing the units, the major topics and subtopics.
- ✓ A **Glossary** giving definitions for mathematical vocabulary used in the course.
- ✓ A **grades record** to keep track of your marks.

The textbook has many exercises; some are quite short, but others have a great number of questions. **You do not have to do every single question!**

- Do as many questions as **you** feel are necessary for you to be confident in your skill.
- It is best to do **all** the word problems.
- If you leave out some questions, try doing every second or every third question. Always do some questions from the end of each exercise because the questions usually get harder at the end. You might use the skipped questions for review before a test.
- If you are working on a difficult skill or concept, do half the exercise one day and finish the exercise the next day. That is a much better way to learn.

Self-tests at the end of most topics have an **Aim** at the top. If you do not meet

the aim, talk to your instructor, find what is causing the trouble, and do some more review before you go on.

A **Review and Extra Practice** section is at the end of each unit. If there is an area of the unit that you need extra practice in, you can use this. Or, if you want, you can use the section for more review.

A **Practice Test** is available for each unit. You may:

- Write the practice test after you have studied the unit as a practice for the end-of-chapter test, OR
- You might want to write it before you start the unit to find what you already know and which areas you need to work on.

Unit tests are written after each unit. Again, you must reach the **Aim** before you begin the next unit. If you do not reach the aim, the instructor will assist you in finding and practising the difficult areas. When you are ready, you can write a B test to show that you have mastered the skills.

A Final Test is to be written when you have finished the book. This final test will assess your skills from the whole book. You have mastered the skills in each unit and then kept using many of them throughout the course. The test reviews all those skills

Grades Record
Book 3

Unit	Practice Test	Date of Test A	Test A	Date of Test B	Test B
Example	√	***Sept. 4, 2011***	$\frac{25}{33}$	***Sept. 7, 2011***	$\frac{28}{33}$
1					
2					
3					
4					
Final Test					

Unit One

Number Sense

Topic A: Emotions and Learning

Emotions, or what we feel about something, play a big part in how we learn. If we are calm, we learn well. If we are afraid or stressed, we do not learn as well.

Math anxiety or the fear of math is learned. If it is learned, it can be unlearned. Most math anxiety comes from bad memories we have of learning math.

Everyone can learn math. There are some people who are better at math than others, but even these people had to **learn** to be good at math.

People who are good at math have learned some skills to help them learn math. One useful skill is test taking.

Preparing for a Test

Getting ready for a test starts on the first day of class. Everything you do in class and at home is part of that getting ready.

Always do as many exercises as you need to help you understand. Once you understand, do ten more questions, then you will know for sure that you really understand.

Always correct your exercises. It is good to know that you are understanding and getting the questions right. It is also good to know if you are not understanding and need some help.

Always do the self-tests. The self-tests can show things that you are not sure of.

Always do the review. Review is part of this book. It is a chance to go over all the things you have learned in a unit before moving on. It prepares you for what will be on the test.

Always do a practice test. A practice test gives you a chance to see how many questions and what kind of questions are on the test.

Taking the Test

Always look over the test. Take a look at the whole test before starting. This takes very little time. Use a highlighter to highlight the questions that you know you can do easily. As you work, put a star beside any questions that you would like to go over again when you finish the test.

Relax. Before starting the test, imagine yourself somewhere where you are calm and confident. Go there in your mind. Focus on how good you feel and how in control you are. If you become anxious during the test, in your mind go to the calming place. Focus on how calm you feel. Then go back to your test.

Always check your test. Before you hand in your test, check it over. Be sure that you answered the question being asked. Look for any starred questions that you had trouble with and go over them again.

How to Deal with Math Anxiety

Anyone can feel anxiety that will slow down learning. The key to learning is to be the "boss" of your anxiety.

One way to be the "boss" is to relax. Try this breathing exercise.

Start by breathing in slowly to the count of four. It may help to close your eyes and count. Now hold your breath for four counts and then let your breath out slowly to the count of four. The counting is silent and should follow this pattern: "breathe in, two, three four; hold, two, three, four; breathe out, two, three, four; wait, two, three four." With practice, the number of counts can be increased. This is an easy and good way to relax.

Now try this exercise quietly and repeat it five times slowly.

Each time you feel anxious about learning, use the breathing exercise to help calm yourself. Ask yourself if what you tried worked. Do you feel calmer?

Remember learning to deal with your math anxiety may take some time. It took you a long time to learn "math anxiety", so it will take some time to overcome it.

Unit Two
Multiplication

Topic A: Multiplying Larger Numbers

It is usually easier to multiply larger numbers if they are written underneath each other. The bottom number is called the **multiplier.**

To find the product of a one digit multiplier, use as many of these steps as you need to complete each multiplication question:

Step 1: Multiply the ones digit in the large number by the one digit multiplier.

Step 2: Multiply the tens digit in the large number by the multiplier.

Step 3: Multiply the hundreds digit in the large number by the multiplier.

Step 4: Multiply the thousands digit in the large number by the multiplier.

Example A: $62 \times 4 =$ _____

Step 1: $4 \times$ 2 ones = 8 ones

$$\begin{array}{r} 62 \\ \times\ 4 \\ \hline 8 \end{array}$$

Step 2: $4 \times$ 6 tens = 24 tens = 2 hundreds and 4 tens

$$\begin{array}{r} 62 \\ \times\ 4 \\ \hline 248 \end{array}$$

The **product** of 62×4 is 248

Exercise One

Find the product. Check your work using the answer key at the end of the exercise.

a) 72×2	b) 81×5	c) 21×8	d) 80×6
e) 73×3	f) 71×3	g) 40×7	h) 90×9
i) 82×4	j) 40×5	k) 92×4	l) 83×3
m) 90×8	n) 71×9	o) 53×2	p) 30×6
q) 81×7	r) 61×2	s) 70×8	t) 41×6
u) 90×5	v) 60×9	w) 92×3	x) 81×4

Answers to Exercise One

a) 144	b) 405	c) 168	d) 480	e) 219	f) 213	g) 280
h) 810	i) 328	j) 200	k) 368	l) 249	m) 720	n) 639
o) 106	p) 180	q) 567	r) 122	s) 560	t) 246	u) 450
v) 540	w) 276	x) 324				

Exercise Two

Find the product. Check your work using the answer key at the end of the exercise.

a) $\begin{array}{r} 90 \\ \times\ 7 \\ \hline \end{array}$	b) $\begin{array}{r} 84 \\ \times\ 2 \\ \hline \end{array}$	c) $\begin{array}{r} 63 \\ \times\ 3 \\ \hline \end{array}$	d) $\begin{array}{r} 92 \\ \times\ 2 \\ \hline \end{array}$
e) $\begin{array}{r} 72 \\ \times\ 4 \\ \hline \end{array}$	f) $\begin{array}{r} 52 \\ \times\ 3 \\ \hline \end{array}$	g) $\begin{array}{r} 41 \\ \times\ 3 \\ \hline \end{array}$	h) $\begin{array}{r} 51 \\ \times\ 4 \\ \hline \end{array}$
i) $\begin{array}{r} 71 \\ \times\ 6 \\ \hline \end{array}$	j) $\begin{array}{r} 61 \\ \times\ 5 \\ \hline \end{array}$	k) $\begin{array}{r} 90 \\ \times\ 6 \\ \hline \end{array}$	l) $\begin{array}{r} 71 \\ \times\ 7 \\ \hline \end{array}$
m) $\begin{array}{r} 60 \\ \times\ 4 \\ \hline \end{array}$	n) $\begin{array}{r} 71 \\ \times\ 5 \\ \hline \end{array}$	o) $\begin{array}{r} 81 \\ \times\ 8 \\ \hline \end{array}$	p) $\begin{array}{r} 51 \\ \times\ 9 \\ \hline \end{array}$
q) $\begin{array}{r} 41 \\ \times\ 4 \\ \hline \end{array}$	r) $\begin{array}{r} 50 \\ \times\ 8 \\ \hline \end{array}$	s) $\begin{array}{r} 61 \\ \times\ 6 \\ \hline \end{array}$	t) $\begin{array}{r} 30 \\ \times\ 7 \\ \hline \end{array}$

u) $\begin{array}{r} 90 \\ \times\ 9 \\ \hline \end{array}$ v) $\begin{array}{r} 30 \\ \times\ 5 \\ \hline \end{array}$ w) $\begin{array}{r} 41 \\ \times\ 8 \\ \hline \end{array}$ x) $\begin{array}{r} 51 \\ \times\ 7 \\ \hline \end{array}$

Answers to Exercise Two

a) 630	b) 328	c) 189	d) 184	e) 288	f) 156	g) 123
h) 204	i) 426	j) 305	k) 540	l) 497	m) 240	n) 355
o) 648	p) 459	q) 164	r) 400	s) 366	t) 210	u) 810
v) 150	w) 328	x) 357				

Example B: $523 \times 3 =$ ____

$$\begin{array}{r} 523 \\ \times\ \ 3 \\ \hline 1\,569 \end{array}$$

Step 1: $3 \times$ 3 ones = 9 ones

Step 2: $3 \times$ 2 tens = 6 tens

Step 3: $3 \times$ 5 hundreds = 15 hundreds = 1 thousand and 5 hundreds

The **product** of **523×3 is 1 569.**

Example C: $901 \times 8 =$ _____

$$\begin{array}{r} 901 \\ \times \quad 8 \\ \hline 7\,2\mathbf{0}8 \end{array}$$

Step 1: $8 \times$ 1 one = 8 ones

Step 2: $8 \times$ 0 tens = 0 tens

Step 3: $8 \times$ 9 hundreds = 72 hundreds = 7 thousands and 2 hundreds

The **product** of **901 $\times$ 8 is 7 208.**

Exercise Three

Find the product. Check your work using the answer key at the end of the exercise.

a) $\begin{array}{r} 601 \\ \times \ 7 \\ \hline \end{array}$

b) $\begin{array}{r} 423 \\ \times \ 3 \\ \hline \end{array}$

c) $\begin{array}{r} 641 \\ \times \ 2 \\ \hline \end{array}$

d) $\begin{array}{r} 922 \\ \times \ 4 \\ \hline \end{array}$

e) $\begin{array}{r} 820 \\ \times 4 \\ \hline \end{array}$

f) $\begin{array}{r} 211 \\ \times \ 5 \\ \hline \end{array}$

g) $\begin{array}{r} 803 \\ \times \ 2 \\ \hline \end{array}$

h) $\begin{array}{r} 542 \\ \times \ 2 \\ \hline \end{array}$

i) $\begin{array}{r} 813 \\ \times\ 3 \\ \hline \end{array}$ j) $\begin{array}{r} 610 \\ \times\ 4 \\ \hline \end{array}$ k) $\begin{array}{r} 901 \\ \times\ 6 \\ \hline \end{array}$ l) $\begin{array}{r} 711 \\ \times\ 8 \\ \hline \end{array}$

m) $\begin{array}{r} 720 \\ \times\ 3 \\ \hline \end{array}$ n) $\begin{array}{r} 910 \\ \times\ 5 \\ \hline \end{array}$ o) $\begin{array}{r} 801 \\ \times\ 6 \\ \hline \end{array}$ p) $\begin{array}{r} 932 \\ \times\ 3 \\ \hline \end{array}$

q) $\begin{array}{r} 731 \\ \times\ 2 \\ \hline \end{array}$ r) $\begin{array}{r} 701 \\ \times\ 5 \\ \hline \end{array}$ s) $\begin{array}{r} 521 \\ \times\ 2 \\ \hline \end{array}$ t) $\begin{array}{r} 632 \\ \times\ 3 \\ \hline \end{array}$

u) $\begin{array}{r} 720 \\ \times\ 4 \\ \hline \end{array}$ v) $\begin{array}{r} 942 \\ \times\ 2 \\ \hline \end{array}$ w) $\begin{array}{r} 710 \\ \times\ 9 \\ \hline \end{array}$ x) $\begin{array}{r} 601 \\ \times\ 8 \\ \hline \end{array}$

Answers to Exercise Three

a) 4 207	b) 1 269	c) 1 282	d) 3 688	e) 3 280	f) 1 055	g) 1 606
h) 1 084	i) 2 439	j) 2 440	k) 5 406	l) 5 688	m) 2 160	n) 4 550
o) 4 806	p) 2 796	q) 1 462	r) 3 505	s) 1 042	t) 1 896	u) 2 880
v) 1 884	w) 6 390	x) 4 808				

Exercise Four

Find the product. Check your work using the answer key at the end of the exercise.

a) $4\,224 \times 2$

b) $1\,203 \times 3$

c) $3\,012 \times 4$

d) $6\,001 \times 9$

e) $8\,412 \times 2$

f) $6\,012 \times 4$

g) $7\,011 \times 5$

h) $9\,021 \times 3$

i) $5\,110 \times 8$

j) $6\,130 \times 2$

k) $8\,101 \times 6$

l) $5\,301 \times 3$

m) $9\,310 \times 2$

n) $7\,231 \times 3$

o) $5\,021 \times 4$

p) $7\,034 \times 2$

q) $6\,010 \times 7$

r) $5\,123 \times 2$

s) $\begin{array}{r} 8\,302 \\ \times\ 3 \\ \hline \end{array}$

t) $\begin{array}{r} 8\,110 \\ \times\ 7 \\ \hline \end{array}$

u) $\begin{array}{r} 8\,021 \\ \times\ 4 \\ \hline \end{array}$

v) $\begin{array}{r} 7\,012 \\ \times\ 4 \\ \hline \end{array}$

w) $\begin{array}{r} 9\,011 \\ \times\ 9 \\ \hline \end{array}$

x) $\begin{array}{r} 6\,001 \\ \times\ 6 \\ \hline \end{array}$

Answers to Exercise Four

a)	8 448	b)	3 609	c)	12 048	d)	54 009	e)	16 824	f)	24 048	g)	35 055
h)	27 063	i)	40 880	j)	12 260	k)	48 606	l)	15 903	m)	18 620	n)	21 693
o)	20 084	p)	14 068	q)	42 070	r)	10 246	s)	24 906	t)	56 770	u)	32 084
v)	28 048	w)	81 099	x)	36 006								

Renaming and Carrying

In the times tables, the products are often two digit numbers. You must **rename** and **carry**. The amount you carry is **added onto** the **product** of the next column.

Example A:

$$\begin{array}{r} 68 \\ \times\ 7 \\ \hline \end{array}$$

Step 1: Multiply the ones by the multiplier.
7×8 ones = 56 ones = 5 tens + 6 ones
Write the 6 ones in the product.
Carry the 5 tens to the tens column and make a note of it for yourself. You might write it above the tens column.

$$\begin{array}{r} {\scriptstyle 5\ \ } \\ 68 \\ \times\ 7 \\ \hline 6 \end{array}$$

Step 2: Multiply the tens by the multiplier.
7×6 tens = 42 tens
Now add on the 5 tens that you carried.
42 tens + 5 tens = 47 tens = 4 hundreds and 7 tens

$$\begin{array}{r} {\scriptstyle 5\ \ } \\ 68 \\ \times\ 7 \\ \hline 476 \end{array}$$

Exercise Five

Find the product. Check your work using the answer key at the end of the exercise.

a) $\begin{array}{r} 16 \\ \times\ 8 \\ \hline \end{array}$ b) $\begin{array}{r} 62 \\ \times\ 6 \\ \hline \end{array}$ c) $\begin{array}{r} 37 \\ \times\ 4 \\ \hline \end{array}$ d) $\begin{array}{r} 14 \\ \times\ 9 \\ \hline \end{array}$

e) $\begin{array}{r} 36 \\ \times\ 7 \\ \hline \end{array}$ f) $\begin{array}{r} 92 \\ \times\ 9 \\ \hline \end{array}$ g) $\begin{array}{r} 48 \\ \times\ 6 \\ \hline \end{array}$ h) $\begin{array}{r} 17 \\ \times\ 2 \\ \hline \end{array}$

i) $\begin{array}{r} 26 \\ \times\ 4 \\ \hline \end{array}$ j) $\begin{array}{r} 54 \\ \times\ 7 \\ \hline \end{array}$ k) $\begin{array}{r} 58 \\ \times\ 8 \\ \hline \end{array}$ l) $\begin{array}{r} 45 \\ \times\ 4 \\ \hline \end{array}$

m) $\begin{array}{r} 56 \\ \times\ 3 \\ \hline \end{array}$ n) $\begin{array}{r} 47 \\ \times\ 5 \\ \hline \end{array}$ o) $\begin{array}{r} 39 \\ \times\ 6 \\ \hline \end{array}$ p) $\begin{array}{r} 75 \\ \times\ 6 \\ \hline \end{array}$

q) $\begin{array}{r} 38 \\ \times\ 5 \\ \hline \end{array}$ r) $\begin{array}{r} 82 \\ \times\ 7 \\ \hline \end{array}$ s) $\begin{array}{r} 98 \\ \times\ 3 \\ \hline \end{array}$ t) $\begin{array}{r} 29 \\ \times\ 5 \\ \hline \end{array}$

u) $\begin{array}{r} 47 \\ \times\ 3 \\ \hline \end{array}$ v) $\begin{array}{r} 74 \\ \times\ 8 \\ \hline \end{array}$ w) $\begin{array}{r} 56 \\ \times\ 5 \\ \hline \end{array}$ x) $\begin{array}{r} 98 \\ \times\ 4 \\ \hline \end{array}$

Answers to Exercise Five

a) 128	b) 372	c) 148	d) 126	e) 252	f) 828	g) 288
h) 34	i) 104	j) 378	k) 464	l) 180	m) 168	n) 235
o) 234	p) 450	q) 190	r) 574	s) 294	t) 145	u) 141
v) 592	w) 280	x) 392				

Exercise Six

Find the product. Check your work using the answer key at the end of the exercise.

a) $\begin{array}{r} 59 \\ \times\ 8 \\ \hline \end{array}$	b) $\begin{array}{r} 77 \\ \times\ 6 \\ \hline \end{array}$	c) $\begin{array}{r} 63 \\ \times\ 4 \\ \hline \end{array}$	d) $\begin{array}{r} 93 \\ \times\ 9 \\ \hline \end{array}$
e) $\begin{array}{r} 38 \\ \times\ 2 \\ \hline \end{array}$	f) $\begin{array}{r} 57 \\ \times\ 9 \\ \hline \end{array}$	g) $\begin{array}{r} 14 \\ \times\ 6 \\ \hline \end{array}$	h) $\begin{array}{r} 35 \\ \times\ 3 \\ \hline \end{array}$
i) $\begin{array}{r} 29 \\ \times\ 4 \\ \hline \end{array}$	j) $\begin{array}{r} 78 \\ \times\ 9 \\ \hline \end{array}$	k) $\begin{array}{r} 63 \\ \times\ 6 \\ \hline \end{array}$	l) $\begin{array}{r} 83 \\ \times\ 5 \\ \hline \end{array}$
m) $\begin{array}{r} 64 \\ \times\ 4 \\ \hline \end{array}$	n) $\begin{array}{r} 46 \\ \times\ 2 \\ \hline \end{array}$	o) $\begin{array}{r} 93 \\ \times\ 7 \\ \hline \end{array}$	p) $\begin{array}{r} 56 \\ \times\ 5 \\ \hline \end{array}$
q) $\begin{array}{r} 97 \\ \times\ 2 \\ \hline \end{array}$	r) $\begin{array}{r} 85 \\ \times\ 4 \\ \hline \end{array}$	s) $\begin{array}{r} 67 \\ \times\ 3 \\ \hline \end{array}$	t) $\begin{array}{r} 57 \\ \times\ 8 \\ \hline \end{array}$
u) $\begin{array}{r} 83 \\ \times\ 9 \\ \hline \end{array}$	v) $\begin{array}{r} 74 \\ \times\ 7 \\ \hline \end{array}$	w) $\begin{array}{r} 98 \\ \times\ 8 \\ \hline \end{array}$	x) $\begin{array}{r} 28 \\ \times\ 2 \\ \hline \end{array}$

Answers to Exercise Six

a) 472	b) 462	c) 252	d) 837	e) 76	f) 513	g) 84
h) 105	i) 116	j) 702	k) 378	l) 415	m) 256	n) 92
o) 651	p) 280	q) 194	r) 340	s) 201	t) 456	u) 747
v) 518	w) 784	x) 56				

Example B: $4 \times 224 =$ _____

$\overset{1}{224}$	$\overset{1}{224}$	$\overset{1}{224}$
$\times\ 4$	$\times\ 4$	$\times\ 4$
6	96	896

Step 1: $4 \times$ 4 ones = 16 ones = 1 ten and 6 ones
Write the 6 ones in the product and carry the one ten.

Step 2: $4 \times$ 2 tens = 8 tens
8 tens + 1 ten we carried = 9 tens

Step 3: $4 \times$ 2 hundreds = 8 hundreds

Example C: $4 \times 456 =$ _____

$\overset{3}{456}$	$\overset{2\ 3}{456}$	$\overset{2\ 3}{456}$
$\times\ 5$	$\times\ 5$	$\times\ 5$
0	80	2 280

Step 1: $5 \times$ 6 ones = 30 ones = 3 tens and 0 ones
The **0** must be written to hold the ones place.
Carry the 3 tens.

Step 2: $5 \times$ 5 tens = 25 tens
25 tens + 3 tens = 28 tens = 2 hundreds and 8 tens
Write the 8 tens in the product. Carry the 2 hundreds.

Step 3: $5 \times$ 4 hundreds = 20 hundreds + 2 hundreds = 22 hundreds
= 2 thousands and 2 hundreds

Exercise Seven

Find the products. Check your work using the answer key at the end of the exercise.

a)	648 × 9	b)	240 × 7	c)	457 × 8	d)	404 × 2
e)	106 × 9	f)	156 × 4	g)	407 × 8	h)	239 × 6
i)	118 × 9	j)	425 × 7	k)	139 × 8	l)	565 × 2
m)	248 × 3	n)	604 × 6	o)	239 × 4	p)	576 × 3
q)	857 × 6	r)	478 × 9	s)	674 × 7	t)	629 × 8
u)	893 × 5	v)	583 × 8	w)	952 × 9	x)	293 × 7

Answers to Exercise Seven

a) 5 832	b) 1 680	c) 3 656	d) 808	e) 954	f) 624
g) 3 256	h) 1 434	i) 1 062	j) 2 975	k) 1 112	l) 1 130
m) 744	n) 3 624	o) 956	p) 1 728	q) 5 142	r) 4 302
s) 4 718	t) 5 032	u) 4 465	v) 4 664	w) 8 568	x) 2 051

Exercise Eight

Find the products. Check your work using the answer key at the end of the exercise.

a) 975×2 b) 409×4 c) 167×5 d) 473×9

e) 483×8 f) 256×3 g) 739×6 h) 378×7

i) 839×4 j) 426×7 k) 396×9 l) 627×8

m) 378×3 n) 586×6 o) 976×2 p) 683×5

q) $\begin{array}{r} 475 \\ \times\ 4 \\ \hline \end{array}$ r) $\begin{array}{r} 385 \\ \times\ 2 \\ \hline \end{array}$ s) $\begin{array}{r} 472 \\ \times\ 6 \\ \hline \end{array}$ t) $\begin{array}{r} 519 \\ \times\ 8 \\ \hline \end{array}$

u) $\begin{array}{r} 258 \\ \times\ 9 \\ \hline \end{array}$ v) $\begin{array}{r} 697 \\ \times\ 3 \\ \hline \end{array}$ w) $\begin{array}{r} 943 \\ \times\ 7 \\ \hline \end{array}$ x) $\begin{array}{r} 294 \\ \times\ 5 \\ \hline \end{array}$

Answers to Exercise Eight

a) 1 950	b) 1 636	c) 835	d) 4 257	e) 3 864	f) 768
g) 4 434	h) 2 646	i) 3 356	j) 2 982	k) 3 564	l) 5 016
m) 1 134	n) 3 516	o) 1 952	p) 3 415	q) 1 900	r) 770
s) 2 832	t) 4 152	u) 2 322	v) 2 091	w) 6 601	x) 1 470

Example D: $9 \times 2\,408 =$ _____

$$\begin{array}{r} {\scriptstyle 3\ \ 7\ \ } \\ 2\,408 \\ \times\ \ 9 \\ \hline 21\,672 \end{array}$$

Step 1: 9×8 ones = 72 ones = 7 tens and 2 ones

Step 2: $9 \times 0 = 0$ tens
0 tens + 7 tens = 7 tens

Step 3: 9×4 hundreds = 36 hundreds = 3 thousands and 6 hundreds

Step 4: 9×2 thousands = 18 thousands
18 thousands + 3 thousands = 21 thousands

Exercise Nine

Find the products. Check your work using the answer key at the end of the exercise.

a) $4\,103 \times 8$

b) $6\,087 \times 4$

c) $3\,280 \times 6$

d) $7\,034 \times 5$

e) $8\,456 \times 2$

f) $4\,758 \times 7$

g) $4\,735 \times 3$

h) $5\,402 \times 9$

i) $5\,394 \times 4$

j) $2\,034 \times 8$

k) $8\,652 \times 5$

l) $6\,392 \times 7$

m) $4\,187 \times 6$

n) $1\,376 \times 9$

o) $3\,297 \times 2$

p) $\begin{array}{r} 9\,628 \\ \times \quad 3 \\ \hline \end{array}$

q) $\begin{array}{r} 7\,689 \\ \times \quad 8 \\ \hline \end{array}$

r) $\begin{array}{r} 5\,160 \\ \times \quad 3 \\ \hline \end{array}$

s) $\begin{array}{r} 4\,256 \\ \times \quad 7 \\ \hline \end{array}$

t) $\begin{array}{r} 5\,491 \\ \times \quad 5 \\ \hline \end{array}$

u) $\begin{array}{r} 8\,032 \\ \times \quad 9 \\ \hline \end{array}$

v) $\begin{array}{r} 8\,645 \\ \times \quad 6 \\ \hline \end{array}$

w) $\begin{array}{r} 6\,453 \\ \times \quad 2 \\ \hline \end{array}$

x) $\begin{array}{r} 8\,129 \\ \times \quad 4 \\ \hline \end{array}$

Answers to Exercise Nine

a) 32 824	b) 24 348	c) 19 680	d) 35 170	e) 16 912	f) 33 306
g) 14 205	h) 48 618	i) 21 576	j) 16 272	k) 43 260	l) 44 744
m) 25 122	n) 12 384	o) 6 594	p) 28 884	q) 61 512	r) 15 480
s) 29 792	t) 27 455	u) 72 288	v) 51 870	w) 12 906	x) 32 516

Topic B: Self-Test

Mark /14 **Aim 11/14**

A. Find the products. **6 marks**

a) 62×4

b) 31×4

c) 423×3

d) 734×2

e) $8\,342 \times 2$

f) $5\,231 \times 3$

B. Multiply these numbers. **4 marks**

a) 44×7

b) 69×8

c) 207×9

d) 184×6

C. Find the products. **4 marks**

a) $2\,834 \times 5$

b) $4\,037 \times 6$

c) $9\,241 \times 8$

d) $3\,652 \times 4$

Answers to Topic B Self-Test

A.

a) 248 b) 124 c) 1 269 d) 1 468 e) 16 684 f) 15 693

B.

a) 308 b) 552 c) 1 863 d) 1 104

C.

a) 14 170 b) 24 222 c) 73 928 d) 14 608

Topic C: Two and Three Digit Multipliers

When the multiplier is more than one digit, you use the same process and get **partial products.** You repeat the steps until you have multiplied by every digit, then add the partial products together.

Example A: $23 \times 24 =$ _____

Part I **Multiply by the ones digit** in the multiplier.
Multiply 3 ones $\times$ 24 using the method you already know.
The first partial product is 72.

$$\begin{array}{r} {\scriptstyle 1\!\!\!/} \\ 24 \\ \times\ 23 \\ \hline 72 \end{array}$$

Part II **Multiply by the tens digit** in the multiplier.
First, **put a 0 to hold the ones place in your partial product.**
We are multiplying by a ten, so we hold the ones place.

Step 1: Multiply 2 tens $\times$ 4 ones = 8 tens
Write the 8 tens under the tens in your first partial product. It is very important to keep the columns straight – ones under one, tens under tens.

Step 2: Multiply 2 tens $\times$ 2 tens = 4 **hundreds**
Write the 4 hundreds in your partial product.
The second partial product is 480.

II

$$\begin{array}{r} {\scriptstyle 1\!\!\!/} \\ 24 \\ \times\ 23 \\ \hline 72 \\ 48\mathbf{0} \end{array}$$

Part III **Add the partial products together,** being sure to add ones to ones, tens to tens, hundreds to hundreds. The sum is the final product.

- Draw a line under the partial products
- Add
- Check your addition

III

$$\begin{array}{r} {\scriptstyle 1} \\ 24 \\ \times\ 23 \\ \hline 72 \\ 480 \\ \hline 552 \end{array}$$

$24 \times 23 = 552$

Example B: $36 \times 425 =$ _____

Part I Multiply by the **ones digit** in the multiplier. $6 \times 425 = 2\,550$

I

$$\begin{array}{r} {\scriptstyle 1\ 3} \\ 425 \\ \times\ 36 \\ \hline 2\,550 \end{array}$$

Part II Multiply by the **tens digit** in the multiplier.
First put a **0** to hold the ones place in the second partial product.

Step 1: 3 tens $\times$ 5 tens = 15 tens = 1 hundred and 5 tens
Write the 5 tens in the second partial product and carry the 1 hundred. Now you can see why it is best to cross out the numbers you carry as soon as you have added them to the product.

Step 2: 3 tens $\times$ 2 tens = 6 **hundreds**
6 hundreds + 1 hundred (carried) = 7 hundreds
nothing to carry

Step 3: 3 tens $\times$ 4 hundreds = 12 **thousands**

$$
\begin{array}{ll}
 & \overset{1}{} \\
 & 1\not{2} \\
\textbf{II} & 425 \\
 & \times\ 36 \\
\hline
 & 2\,550 \\
 & \underline{12\,75\mathbf{0}} \\
\textbf{III} & 15\,300
\end{array}
$$

Part III Add the partial products together.

$36 \times 425 = 15\,300$

Keeping the columns straight with ones under ones, tens under tens, hundreds under hundreds is very important. Working on large-squared graphing paper using one digit per square is often helpful.

tens $\times$ tens = hundreds
tens $\times$ hundreds = thousands

Exercise One

Multiply, being very careful to keep the columns straight when you write your partial products. Check your work using the answer key at the end of the exercise.

a) 84×12

168
840
1 008

b) 73×12

c) 50×42

d) 62×31

e) 61×42

f) 91×53

g) 92×31

h) 91×49

i) 72×48

j) 53×30

k) 41×53

l) 42×94

m) 80×86

n) 31×79

o) 54×40

p) 61×48

q) 60×31

r) 55×73

s) 84×56

t) 53×38

Answers to Exercise One

a) 1 008	b) 876	c) 2 100	d) 1 922	e) 2 562	f) 4 823
g) 2 852	h) 4 459	i) 3 456	j) 1 590	k) 2 173	l) 3 948
m) 6 880	n) 2 449	o) 2 160	p) 2 928	q) 1 860	r) 4 015
s) 4 704	t) 2 014				

Exercise Two

Multiply, being very careful to keep the columns straight when you write your partial products. Check your work using the answer key at the end of the exercise.

a) 26 × 65

b) 73 × 17

c) 57 × 96

d) 83 × 24

e) 49 × 78

f) 58 × 57

g) 73 × 85

h) 48 × 39

i) 93 × 46

j) 86 × 97

k) 51 × 18

l) 56 × 69

m)	26 × 72	n)	92 × 28	o)	75 × 52	p)	78 × 36
q)	87 × 41	r)	64 × 86	s)	39 × 59	t)	49 × 71

Answers to Exercise Two

a) 1 690	b) 1 241	c) 5 472	d) 1 992	e) 3 822	f) 3 306
g) 6 205	h) 1 872	i) 4 278	j) 8 342	k) 918	l) 3 864
m) 1 872	n) 2 576	o) 3 900	p) 2 808	q) 3 567	r) 5 504
s) 2 301	t) 3 479				

When the multiplier has a zero in the ones place, use this shortcut.

Example A:

$$\begin{array}{r} 48 \\ \times\ 80 \\ \hline \mathbf{3\,840} \end{array}$$

Step 1: 0 ones × 48 = **0**
Place one zero in the product and that will hold the ones place.

Step 2: Multiply by the tens digit and write the product beside the zero.

Example B:

$$\begin{array}{r} 97 \\ \times\ 20 \\ \hline 1\,94\mathbf{0} \end{array}$$

Exercise Three

Find the products. Use the shortcut for multipliers with a zero in them. Check your work using the answer key at the end of the exercise.

a)	76 × 70 = 5 32**0**	b)	52 × 10	c)	91 × 40	d)	83 × 60
e)	49 × 50	f)	61 × 30	g)	16 × 90	h)	36 × 80
i)	398 × 10	j)	432 × 20	k)	863 × 50	l)	907 × 30
m)	503 × 40	n)	452 × 80	o)	943 × 70	p)	248 × 90
q)	6 287 × 40	r)	9 025 × 60	s)	8 907 × 80	t)	300 × 90
u)	9 075 × 20	v)	3 952 × 30	w)	1 528 × 70	x)	7 106 × 10

Answers to Exercise Three

a) 5 320	b) 520	c) 3 640	d) 4 980	e) 2 450	f) 1 830
g) 1 440	h) 2 880	i) 3 980	j) 8 640	k) 43 150	l) 27 210
m) 20 120	n) 36 160	o) 66 010	p) 22 320	q) 251 480	r) 541 500
s) 712 560	t) 27 000	u) 181 500	v) 118 560	w) 106 960	x) 71 060

How are you doing? Ask your instructor for help if you are not comfortable with multiplying.

Exercise Four

Here is more practice for you. Find the products. Use the shortcut for multipliers with a zero in them. Check your work using the answer key at the end of the exercise.

a) 225×59 b) 342×80 c) 401×94

d) 970×52 e) 138×21 f) 852×10

g) 206×37 h) 71×86 i) 47×38

j)	38 × 36	k)	58 × 90	l)	45 × 19
m)	63 × 20	n)	19 × 84	o)	258 × 95
p)	408 × 86	q)	600 × 61	r)	107 × 21
s)	129 × 37	t)	246 × 92	u)	182 × 54
v)	3 605 × 23	w)	1 268 × 36	x)	8 902 × 75
y)	2 514 × 40	z)	3 004 × 51	aa)	1 408 × 90

Answers to Exercise Four

a) 13 275	b) 27 360	c) 37 694	d) 50 440	e) 2 898
f) 8 520	g) 7 622	h) 6 106	i) 1 786	j) 1 368
k) 5 220	l) 855	m) 1 260	n) 1 596	o) 24 510
p) 35 088	q) 36 600	r) 2 247	s) 4 773	t) 22 632
u) 9 828	v) 82 915	w) 45 648	x) 667 650	y) 100 560
z) 153 204	aa) 126 720			

To multiply by three digit multipliers, use the same method with one more part.

$417 \times 368 =$ _____

$$\begin{array}{r} 417 \\ \times\ 368 \\ \hline 3\,336 \\ 25\,02\mathbf{0} \\ \underline{125\,1\mathbf{00}} \\ 153\,456 \end{array}$$

Part I Multiply by the 8 ones.

Part II Multiply the 6 tens; hold the ones place with **0**.

Part III Multiply by the 3 hundreds.
Put **00** to hold the ones and tens places in the third partial product.

Step 1: 3 hundreds $\times$ 7 ones = 21 hundreds = 2 thousands and 1 hundred
Write the 1 hundred and carry the 2 thousands.

Step 2: 3 hundreds $\times$ 1 ten = 3 thousands
3 thousands + 2 thousands (carried = 5 thousands

Step 3: 3 hundreds $\times$ 4 hundreds = 12 **ten thousands**

Part IV Add the partial products.

Exercise Five

Find the products. Check your work using the answer key at the end of the exercise.

a) 416 × 213

b) 375 × 291

c) 361 × 475

d) 275 × 863

e) 984 × 469

f) 489 × 578

g) 498 × 123

h) 267 × 854

i) 613 × 368

j) 725 × 547

k) 269 × 912

l) 752 × 697

m) 983 × 357

n) 835 × 148

o) 386 × 296

Answers to Exercise Five

a) 88 608	b) 109 125	c) 171 475	d) 237 325	e) 461 496
f) 282 642	g) 61 254	h) 228 018	i) 225 584	j) 396 575
k) 245 328	l) 524 144	m) 350 931	n) 123 580	o) 114 256

Exercise Six

Find the products. Check your work using the answer key at the end of the exercise.

a) $\begin{array}{r} {\scriptstyle 1\ \not{3}\ \not{2}\ \not{4}} \\ 3\,176 \\ \times\ 184 \\ \hline 12\,704 \\ 254\,080 \\ 317\,600 \\ \hline 584\,384 \end{array}$

b) $\begin{array}{r} 2\,090 \\ \times\ 257 \\ \hline \end{array}$

c) $\begin{array}{r} 3\,569 \\ \times\ 524 \\ \hline \end{array}$

d) $\begin{array}{r} 5\,480 \\ \times\ 271 \\ \hline \end{array}$

e) $\begin{array}{r} 9\,274 \\ \times\ 626 \\ \hline \end{array}$

f) $\begin{array}{r} 5\,169 \\ \times\ 145 \\ \hline \end{array}$

g) $\begin{array}{r} 7\,032 \\ \times\ 893 \\ \hline \end{array}$

h) $\begin{array}{r} 5\,261 \\ \times\ 397 \\ \hline \end{array}$

i) $\begin{array}{r} 7\,036 \\ \times\ 123 \\ \hline \end{array}$

j) 8 921 × 232

k) 4 736 × 247

l) 5 793 × 347

m) 2 973 × 341

n) 5 907 × 308

o) 5 361 × 213

Answers to Exercise Six

a) 584 384	b) 537 130	c) 1 870 156	d) 1 485 080	e) 5 805 524
f) 749 505	g) 6 279 576	h) 2 088 617	i) 865 428	j) 2 069 672
k) 1 169 792	l) 2 010 171	m) 1 013 793	n) 1 819 356	o) 1 141 893

You know to hold the ones place with a zero if the multiplier has a zero in the ones place. Use the same skill if the multiplier has a zero in the **tens** place.

$927 \times 405 =$ _____

$$\begin{array}{r} 927 \\ \times\ 405 \\ \hline 4\,635 \\ 370\,8\mathbf{00} \\ \hline 375\,435 \end{array}$$

Part I Multiply by the 5 ones.

Part II Multiply by the 0 tens.

- Hold the ones place with a 0.
- $0 \times 927 = 0$

  Place one zero in the tens place in the second partial product.

Part III Multiply by the 4 hundreds. The ones and tens places are already held by zeros. Start this partial product in the hundreds place on the same line.

Part IV Add the partial products.

Exercise Seven

Find the products. Check your work using the answer key at the end of the exercise.

a)
$$\begin{array}{r} {\scriptstyle 2\ 2\ \ } \\ 698 \\ \times\ 301 \\ \hline 698 \\ 209\,400 \\ \hline 210\,098 \end{array}$$

b)
$$\begin{array}{r} 923 \\ \times\ 403 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 830 \\ \times\ 108 \\ \hline \end{array}$$

d) 482 × 206

e) 432 × 205

f) 625 × 409

g) 175 × 408

h) 765 × 506

i) 1 576 × 702

j) 432 × 405

k) 625 × 409

l) 175 × 408

m) 5 874 × 309

n) 7 384 × 104

p) 6 538 × 603

Answers to Exercise Seven

a) 210 098	b) 371 969	c) 89 640	d) 99 292	e) 88 560
f) 255 625	g) 71 400	h) 387 090	i) 1 106 352	j) 174 960
k) 255 625	l) 71 400	m) 1 815 066	n) 767 936	o) 3 942 414

Multiplying by 10, 100, and 1 000

Exercise Eight

Do the following questions and see if you can find the pattern. Check your work using the answer key at the end of the exercise.

a) $83 \times 10 = 830$

b) 46×10

c) 97×10

d) 123×10

e) 70×10

f) 129×10

g) $1\,852 \times 10$

h) $29\,871 \times 10$

i) 45×100

j) 26×100

k) 432×100

l) 679×100

m) $2\,482 \times 100$

n) $9\,037 \times 100$

o) $46\,207 \times 100$

p) $97\,512 \times 100$

q) $23 \times 1\,000$

r) $452 \times 1\,000$

s)	207 × 1 000	t)	348 × 1 000	u)	2 118 × 1 000
v)	2 431 × 1 000	w)	23 681 × 1 000	x)	48 203 × 1 000

Answers to Exercise Eight

a) 830	b) 460	c) 970	d) 1 230	e) 700
f) 1 290	g) 18 520	h) 298 710	i) 4 500	j) 2 600
k) 43 200	l) 67 900	m) 248 200	n) 903 700	o) 4 620 700
p) 9 751 200	q) 23 000	r) 452 000	s) 207 000	t) 348 000
u) 2 118 000	v) 2 431 000	w) 23 681 000	x) 48 203 000	

And the pattern is …

When multiplying by 10, 100, 1 000, 10 000, etc., place as many zeros to the right of the number as there are zeros in the 10, 100, 1 000, etc.

- To multiply by 10 put one zero after the number.
- To multiply by 100 put two zeros after the number.
- To multiply by 1 000 put three zeros after the number.

Exercise Nine

Find the products using the short method. Do not rewrite the questions. Check your work using the answer key at the end of the exercise.

a) $12 \times 10 =$ *120*

b) $10 \times 3\,175 =$ _____

c) $162 \times 10 =$ _____

d) $10 \times 53\,821 =$ _____

e) $10 \times 123 =$ _____

f) $27\,342 \times 10 =$ _____

g) $10 \times 98 =$ _____

h) $1\,134 \times 10 =$ _____

i) $15 \times 100 =$ _____

j) $100 \times 278 =$ _____

k) $9\,134 \times 100 =$ _____

l) $651 \times 100 =$ _____

m) $100 \times 5\,169 =$ _____

n) $100 \times 24\,815 =$ _____

o) $10 \times 905 =$ _____

p) $45\,683 \times 10 =$ _____

q) $1\,000 \times 87 =$ _____

r) $521 \times 1\,000 =$ _____

s) $1\,000 \times 68\,935 =$ _____

t) $1\,000 \times 8\,902 =$ _____

u) $1\,576 \times 1\,000 =$ _____

v) $31\,584 \times 1\,000 =$ _____

w) $1\,000 \times 426 =$ _____

x) $72 \times 1\,000 =$ _____

Answers to Exercise Nine

a) 120	b) 31 750	c) 1 620	d) 538 210	e) 1 230
f) 273 420	g) 980	h) 11 340	i) 1 500	j) 27 800
k) 913 400	l) 65 100	m) 516 900	n) 2 481 500	o) 9 050
p) 456 830	q) 87 000	r) 521 000	s) 68 935 000	t) 8 902 000
u) 15 676 000	v) 31 584 000	w) 426 000	x) 72 000	

Topic C: Self-Test

Mark /12 **Aim 10/12**

A. Multiply these numbers.

a) 47 × 39

b) 58 × 93

c) 48 × 100

d) 982 × 1 000

e) 678 × 39

f) 4 579 × 86

g) 8 703 × 93

h) 7 390 × 85

i) 8 047 × 236

j) 4 238 × 197

k) 8 200 × 444

l) 7 365 × 409

Answers to Topic C Self-Test

A.

a) 1 833 b) 5 394 c) 4 800 d) 982 000 e) 26 442

f) 393 794 g) 809 379 h) 628 150 i) 1 899 092 j) 834 886

k) 3 640 800 l) 3 012 285

Topic D: Estimating Products

Before you practice estimating products, look at the easy multiplication that can be done when the factors end in zeros.

You already know how to quickly multiply by 10, 100, 1 000, etc..

You can find the products in questions like these using regular multiplication:

400	500	1 600
$\times$ 20	$\times$ 200	$\times$ 2 000
8 000	100 000	3 200 000

But here is a shortcut:

- Count all the zeros at the **end** of the numbers in both factors.
- Write down that many zeros at the end of the product.
- Multiply the other digits in the usual way and put them before the zeros.

Example A: $30 \times 500 =$ _____

- How many zeros at the end of the factors? **3**
- Write them down. **000**
- Multiply the other digits and put them before the zeros.

  $3 \times 5 = 15$

  $30 \times 500 = 15$ **000**

Example B: $400 \times 3\,000 =$ _____

- How many zeros at the end of the factors? **5**
- **00000**
- $4 \times 3 = 12$
  $400 \times 3\,000 = 1\,2$**00 000**

Exercise One

Find the products using the shortcut. Check your work using the answer key at the end of the exercise.

a) 300×20 — *6 **000***

b) $6\,000 \times 200$

c) 210×20

d) 800×600

e) 400×500

f) $6\,000 \times 90$

g) $50\,000 \times 6\,000$

h) $80\,000 \times 30$

i) $5\,000 \times 50$

j) 70×80

k) $3\,000 \times 700$

l) $50\,000 \times 900$

m) $9\,000 \times 8\,000$

n) $60\,000 \times 90$

o) $90\,000 \times 2\,000$

p) 600×600

q) $40\,000 \times 800$

r) $2\,400 \times 70$

s) 390 × 40

t) 7 200 × 5 000

u) 7 000 × 7 000

v) 61 000 × 400

w) 5 200 × 300

x) 40 × 60

Answers to Exercise One

a) 6 000	b) 1 200 000	c) 4 200	d) 480 000	e) 200 000
f) 540 000	g) 300 000 000	h) 2 400 000	i) 250 000	j) 5 600
k) 2 100 000	l) 45 000 000	m) 72 000 000	n) 5 400 000	o) 180 000 000
p) 360 000	q) 32 000 000	r) 168 000	s) 15 600	t) 36 000 000
u) 49 000 000	v) 24 400 000	w) 1 560 000	x) 2 400	

To find an estimated product, round the factors **before** you multiply.

If a factor has only one digit, do not round it.

6 258	rounds to	6 000
× 3	leave as	× 3
	estimated product is	18 000

491	rounds to	500
× 24	rounds to	× 20
	estimated product is	10 000

Exercise Two

Find an estimated product. Check your work using the answer key at the end of the exercise.

a) $\begin{array}{r} 78 \\ \times\ 34 \\ \hline \end{array} \approx \begin{array}{r} 80 \\ \times\ 30 \\ \hline 2\,400 \end{array}$

b) $\begin{array}{r} 682 \\ \times\ 63 \\ \hline \end{array}$

c) $\begin{array}{r} 448 \\ \times\ 133 \\ \hline \end{array}$

d) $\begin{array}{r} 2\,437 \\ \times\ 33 \\ \hline \end{array}$

e) $\begin{array}{r} 8\,287 \\ \times\ 88 \\ \hline \end{array}$

f) $\begin{array}{r} 9\,713 \\ \times\ 12 \\ \hline \end{array}$

g) $\begin{array}{r} 987 \\ \times\ 346 \\ \hline \end{array}$

h) $\begin{array}{r} 324 \\ \times\ 286 \\ \hline \end{array}$

i) $\begin{array}{r} 4\,338 \\ \times\ 514 \\ \hline \end{array}$

j) $\begin{array}{r} 2\,642 \\ \times\ 397 \\ \hline \end{array}$

k) $\begin{array}{r} 4\,368 \\ \times\ 268 \\ \hline \end{array}$

l) $\begin{array}{r} 9\,048 \\ \times\ 370 \\ \hline \end{array}$

m) 31 968 × 272

n) 435 × 92

o) 67 × 21

p) 698 × 75

q) 1 864 × 23

r) 92 167 × 492

s) 45 530 × 581

t) 75 648 × 69

Answers to Exercise Two

a) 80 x 30 = 2 400
b) 700 x 60 = 42 000
c) 400 x 100 = 40 000
d) 2 000 x 30 = 60 000
e) 8 000 x 90 = 720 000
f) 10 000 x 10 = 100 000
g) 1 000 x 300 = 300 000
h) 300 x 300 = 90 000
i) 4 000 x 500 = 2 000 000
j) 3 000 x 400 = 1 200 000
k) 4 000 x 300 = 1 200 000
l) 9 000 x 400 = 3 600 000
m) 30 000 x 300 = 9 000 000
n) 400 x 90 = 36 000
o) 70 x 20 = 1 400
p) 700 x 80 = 56 000
q) 2 000 x 20 = 40 000
r) 90 000 x 500 = 45 000 000
s) 50 000 x 600 = 30 000 000
t) 80 000 x 70 = 5 600 000

Topic D: Self-Test

Mark /18 **Aim 15/18**

A. Multiply these numbers. **6 marks**

a) $\begin{array}{r} 600 \\ \times\ 70 \\ \hline \end{array}$

b) $\begin{array}{r} 9\,000 \\ \times\ 30 \\ \hline \end{array}$

c) $\begin{array}{r} 5\,000 \\ \times\ 600 \\ \hline \end{array}$

d) $\begin{array}{r} 3\,000 \\ \times\ 500 \\ \hline \end{array}$

e) $\begin{array}{r} 400 \\ \times\ 50 \\ \hline \end{array}$

f) $\begin{array}{r} 8\,000 \\ \times\ 1\,000 \\ \hline \end{array}$

B. Find an estimated product. **12 marks**

a) $\begin{array}{r} 87 \\ \times\ 23 \\ \hline \end{array}$

b) $\begin{array}{r} 268 \\ \times\ 25 \\ \hline \end{array}$

c) $\begin{array}{r} 9\,421 \\ \times\ 75 \\ \hline \end{array}$

d) $\begin{array}{r} 2\,632 \\ \times\ 49 \\ \hline \end{array}$

e) 365
× 455

f) 7 264
× 590

Answers to Topic D Self-Test

A.

a) 42 000 b) 270 000 c) 3 000 000 d) 1 500 000 e) 20 000
f) 8 000 000

B.

a) 90 x 20 = 1 800
b) 300 x 30 = 9 000
c) 9 000 x 80 = 720 000
d) 3 000 x 50 = 150 000
e) 400 x 500 = 200 000
f) 7 000 x 600 = 4 200 000

Topic E: Multiplication Problems

Multiplication problems usually give information for **one** unit and ask information for many units. For example, you may be given an **average** distance for one hour and asked for a distance for six hours. You may be given the price for one item and asked the price for 96 items.

Remember that multiplication is **fast addition of equal amounts.** Key words for addition may also point to multiplication.

Key Words That Point to Multiplication

altogether	combined	in all
total	the average is	product
how many?	how much?	each

Exercise One

Do these problems by following the five problem solving steps. Remember to (circle) the information and underline what is being asked. Be sure to write down your estimation **before** you find the actual solution. Check your work using the answer key at the end of the exercise.

a) Maria spent $151 a month to ride to work. How much did it cost her to ride to work for the whole year? (1 year = 12 months)

b) Fred travels 121 km a day on his delivery route. How far does he travel in 5 working days?

c) Manuel buys 340 L of gas a month. In 6 months, how many litres of gas does Manual buy?

d) An apartment building has 16 apartments, each rented for $870 a month. What is the total monthly rental income from this building?

e) A farmer sells potatoes at $53 per 50 kg sack. How much will he get for 75 sacks?

f) Bob is paid $12 per hour. If he worked 39 hours last week and 24 hours this week, how much did he earn for the two weeks? (two operations)

g) It costs $35 260 per working day to run the factory. How much does it cost to run this factory for a month of 23 working days?

h) The train has an average speed of 75 km an hour. How far does this train travel in 14 hours?

i) Lee's sports car averages 18 km per litre. How far can she drive on 12 L of gasoline?

j) Frank bought a used car and paid for it over 15 months. He made 15 monthly payments of $325 each. How much did he pay?

k) Tickets for the rock concert were $54 each. The number of tickets sold was 15 370. How much money was made in ticket sales?

l) Bob is a jogger. He jogs 10 km each day, rain, shine or holidays! How many kilometres does he jog in 1 year? (1 year = 365 days)

m) Bill is painting all the 49 apartments in a building. Each apartment uses 9 L of paint. The paint costs $8 per litre. How much paint will he need to paint all the apartments?

n) If an airplane's average speed is 475 km/h, how far will it travel in 9 hours?

o) Sound travels 320 m per second. How far does it travel in 1 minute?
(1 minute = 60 seconds)

p) Sara wants to carpet her new living room. The room is 7 metres by 6 metres. How much carpet will she need?

Answers to Exercise One

a)	$1 812	b)	605 km	c)	2 040 L	d)	$132 920
e)	$3 975	f)	63 hours, $4 556	g)	$810, 980	h)	1 050 km
i)	216 km	j)	$4 875	k)	$829 980	l)	3 650 km
m)	441 l L, $3 528	n)	4 275 km	o)	19 200 m	p)	42 sq m

Topic E: Self-Test

Mark /8 **Aim 6/8**

A. Solve these problems. Show all your work. Give yourself one mark for the correct method and one mark for the correct answer. 8 marks

a) A freight train has 70 cars. Each car can hold 22 680 kilograms of cargo. How much cargo can the train hold in all?

b) The highway distance between Fernie and Edmonton is 621 kilometres. How many kilometres will a bus travel in 68 trips from Fernie to Edmonton?

c) A tanker truck made 275 trips in one year. The truck hauled 23 800 litres each time. How many litres did the truck haul during the year?

d) The college cafeteria hopes to serve 425 people each day. **Estimate** how many meals will be served if the cafeteria is open 175 days.

Answers to Topic F Self-Test

A.

a) 1 587 600 kilograms
b) 42 228 kilometres
c) 6 545 000 litres
d) 400 x 200 = 80 000 meals

Unit 2 Review - Multiplication

You will now practice all the skills you learned in Unit 2. Check your work using the answer key at the end of the review.

A. Find the products.

a) $\begin{array}{r} 81 \\ \times\ 5 \\ \hline \end{array}$

b) $\begin{array}{r} 73 \\ \times\ 3 \\ \hline \end{array}$

c) $\begin{array}{r} 441 \\ \times\ 2 \\ \hline \end{array}$

d) $\begin{array}{r} 512 \\ \times\ 4 \\ \hline \end{array}$

e) $\begin{array}{r} 9\,342 \\ \times\ 2 \\ \hline \end{array}$

f) $\begin{array}{r} 8\,132 \\ \times\ 3 \\ \hline \end{array}$

B. Find the products.

a) $\begin{array}{r} 48 \\ \times\ 7 \\ \hline \end{array}$

b) $\begin{array}{r} 78 \\ \times\ 9 \\ \hline \end{array}$

c) $\begin{array}{r} 892 \\ \times\ 8 \\ \hline \end{array}$

d) $\begin{array}{r} 536 \\ \times\ 6 \\ \hline \end{array}$

e) $\begin{array}{r} 2\,375 \\ \times\ 4 \\ \hline \end{array}$

f) $\begin{array}{r} 5\,649 \\ \times\ 3 \\ \hline \end{array}$

C. Find the products.

a) $\begin{array}{r} 67 \\ \times\ 19 \\ \hline \end{array}$

b) $\begin{array}{r} 581 \\ \times\ 34 \\ \hline \end{array}$

c) $\begin{array}{r} 7\,310 \\ \times\ 46 \\ \hline \end{array}$

d) $\begin{array}{r} 754 \\ \times\ 692 \\ \hline \end{array}$

e) $\begin{array}{r} 2\,735 \\ \times\ 846 \\ \hline \end{array}$

f) $\begin{array}{r} 857 \\ \times\ 308 \\ \hline \end{array}$

g) $\begin{array}{r} 629 \\ \times\ 407 \\ \hline \end{array}$

h) $\begin{array}{r} 2\,805 \\ \times\ 15 \\ \hline \end{array}$

i) $\begin{array}{r} 5\,102 \\ \times\ 743 \\ \hline \end{array}$

D. Find the products. Use the shortcut.

a) $\begin{array}{r} 1\,000 \\ \times\ 82 \\ \hline \end{array}$

b) $\begin{array}{r} 100 \\ \times\ 26 \\ \hline \end{array}$

c) $\begin{array}{r} 6\,263 \\ \times\ 1\,000 \\ \hline \end{array}$

d) 407 x 100 =

e) 100 x 9 482 =

f) 3 614 x 10 =

g) 1 000 x 1 795 =

E. Find the products. Use the shortcut.

a) 50×40

b) 600×800

c) $9\,000 \times 500$

F. Find an estimated product.

a) 68×39

b) 185×94

c) $6\,763 \times 69$

d) 853×399

e) $2\,735 \times 846$

f) $68\,924 \times 268$

G. Word Problems.

a) The Yellow River in China is 5 464 kilometres long. How many kilometres will 75 boats cover if they travel the length of the river?

b) Mount Logan in Canada is 5 959 metres high. How many metres would 24 climbers cover if they were able to climb to the top of Mt. Logan?

c) How many pieces of candy are needed to pack 500 boxes, if each box has 8 rows and each row has 15 pieces of candy? (2-step question)

d) The distance between Prince Rupert and Kelowna is 1 409 km. Estimate how many kilometres 42 trucks will travel if each truck makes one trip.

Answers to Unit 2 Review

A.

a) 405 b) 219 c) 882 d) 2 048 e) 18 684 f) 24 396

B.

a) 336 b) 702 c) 7 136 d) 3 216 e) 9 500 f) 16 947

C.

a) 4 873 b) 19 754 c) 336 260 d) 521 768 e) 2 313 810
f) 263 956 g) 256 003 h) 42 075 i) 3 790 786

D.

a) 82 000 b) 2 600 c) 6 263 000 d) 40 700 e) 948 200
f) 36 140 g) 1 795 000

E.

a) 2 000 b) 480 000 c) 4 500 000

F.

a) 70 x 40 = 2 800 b) 200 x 90 = 18 000
c) 7 000 x 70 = 490 000 d) 900 x 400 = 360 000
e) 3 000 x 800 = 2 4000 000 f) 70 000 x 300 = 21 000 000

G.

a) 409 800 kilometres
b) 552 816 metres
c) 60 000 pieces of candy
d) 1 000 x 40 = 40 000 kilometres

CONGRATULATIONS!!

Now you have finished Unit 2.

TEST TIME!

Ask your instructor for the Practice Test for this unit.
Once you've done the practice test,
you need to do the unit 2 test.
Again, ask your instructor for this.
Good luck!

Unit Three
Division

Topic A: Introduction and Division Facts

Division is an interesting operation. Both these signs tell you to divide:

$\div$ $\overline{)}$

Division is the opposite of multiplication.

- Multiplication takes equal-sized groups and puts the groups together to find the total.

  ○○○○ ○○○○ ○○○○ $3 \times 4 = 12$

- **Division** takes the total and **separates** that amount into equal groups. You can find the number of equal groups or the size of each group.

  ○○○○○○○○○○○○ = ○○○○ ○○○○ ○○○○ $12 \div 4 = 3$

$4 \times 3 = 12$ $12 \div 3 = 4$ $3\overline{)12}$ (4)

$3 \times 4 = 12$ $12 \div 4 = 3$ $4\overline{)12}$ (3)

Learn this vocabulary for division:

Dividend – The number or quantity to be divided; the amount altogether.

Divisor – The number we divide by. The divisor tells us the number of groups or the quantity in each group that the dividend is to be separated into.

Quotient – ("kwō shent") The answer to a division question.

$$\begin{array}{r} quotient \\ divisor\overline{)\,dividend} \end{array}$$

dividend $\div$ *divisor* = *quotient*

If you have learned your times tables well, the division facts will be easier. The times table chart can be used to find division facts.

To use the times table chart for division facts:

- Find the divisor in the column on the left of the times table chart.
- Run your finger in a straight line across the divisor row until you come to the dividend.
- Go straight up that column and the quotient should be the top number.

Try a few while you are doing Exercise One.

Exercise One

Complete this chart to help yourself understand the connection between multiplication and division. The first one is done for you. Check your work using the answer key at the end of the exercise.

	Multiplication	**Division**	**Division**	**"Say"**
a)	$5 \times 3 = 15$ $3 \times 5 = 15$	$15 \div 3 = 5$ $15 \div 5 = 3$	$3\overline{)15}$ $= 5$ $5\overline{)15}$ $= 3$	*15 divided by 3 is 5* *15 divided by 5 is 3*
b)	$8 \times 6 = 48$ $6 \times 8 = 48$	$48 \div 6 = 8$ $48 \div 8 = 6$	$6\overline{)48}$ $8\overline{)48}$	*48 divided by 6 is 8*
c)	$3 \times 7 = 21$			
d)	$5 \times 9 = 45$			

	Multiplication	Division	Division	"Say"
e)	$4 \times 6 = 24$			
f)	$2 \times 8 = 16$			
g)	$7 \times 10 = 70$			
h)	$6 \times 9 = 54$			
i)	$9 \times 4 = 36$			
j)	$6 \times 7 = 42$			
k)	$7 \times 9 = 63$			

Answers to Exercise One

	Multiplication	Division	Division	"Say"
a)	$5 \times 3 = 15$ $3 \times 5 = 15$	$15 \div 3 = 5$ $15 \div 5 = 3$	$3\overline{)15}\ 5$ $5\overline{)15}\ 3$	*15 divided by 3 is 5* *15 divided by 5 is 3*
b)	$8 \times 6 = 48$ $6 \times 8 = 48$	$48 \div 6 = 8$ $48 \div 8 = 6$	$6\overline{)48}\ 8$ $8\overline{)48}\ 6$	*48 divided by 6 is 8* *48 divided by 8 is 6*
c)	$3 \times 7 = 21$ $7 \times 3 = 21$	$21 \div 7 = 3$ $21 \div 3 = 7$	$7\overline{)21}\ 3$ $3\overline{)21}\ 7$	21 divided by 7 is 3 21 divided by 3 is 7
d)	$5 \times 9 = 45$ $9 \times 5 = 45$	$45 \div 9 = 5$ $45 \div 5 = 9$	$9\overline{)45}\ 5$ $5\overline{)45}\ 9$	45 divided by 9 is 5 45 divided by 5 is 9
e)	$4 \times 6 = 24$ $6 \times 4 = 24$	$24 \div 6 = 4$ $24 \div 4 = 6$	$6\overline{)24}\ 4$ $4\overline{)24}\ 6$	24 divided by 6 is 4 24 divided by 4 is 6
f)	$2 \times 8 = 16$ $8 \times 2 = 16$	$16 \div 8 = 2$ $16 \div 2 = 8$	$8\overline{)16}\ 2$ $2\overline{)16}\ 8$	16 divided by 8 is 2 16 divided by 2 is 8
g)	$7 \times 10 = 70$ $10 \times 7 = 70$	$70 \div 10 = 7$ $70 \div 7 = 10$	$10\overline{)70}\ 7$ $7\overline{)70}\ 10$	70 divided by 10 is 7 70 divided by 7 is 10
h)	$6 \times 9 = 54$ $9 \times 6 = 54$	$54 \div 9 = 6$ $54 \div 6 = 9$	$9\overline{)54}\ 6$ $6\overline{)54}\ 9$	54 divided by 9 is 6 54 divided by 6 is 9
i)	$9 \times 4 = 36$ $4 \times 9 = 36$	$36 \div 4 = 9$ $36 \div 9 = 4$	$4\overline{)36}\ 9$ $9\overline{)36}\ 4$	36 divided by 4 is 9 36 divided by 9 is 4
j)	$6 \times 7 = 42$ $7 \times 6 = 42$	$42 \div 7 = 6$ $42 \div 6 = 7$	$7\overline{)42}\ 6$ $6\overline{)42}\ 7$	42 divided by 7 is 6 42 divided by 6 is 7

	Multiplication	Division	Division	"Say"
k)	$7 \times 9 = 63$ $9 \times 7 = 63$	$63 \div 9 = 7$ $62 \div 7 = 9$	$9\overline{)63}$ 7 $7\overline{)63}$ 9	63 divided by 9 is 7 63 divided by 7 is 9

Exercise Two

Complete this chart to help yourself understand the connection between multiplication and division. Check your work using the answer key at the end of the exercise.

	Multiplication	Division	Division	"Say"
a)	$8 \times 4 = 32$			
b)	$5 \times 10 = 50$			
c)	$2 \times 3 = 6$			
d)	$5 \times 8 = 40$			

	Multiplication	Division	Division	"Say"
e)	$3 \times 4 = 12$			
f)	$2 \times 10 = 20$			
g)	$9 \times 8 = 72$			
h)	$6 \times 5 = 30$			
i)	$7 \times 4 = 28$			
j)	$10 \times 3 = 30$			
k)	$5 \times 5 = 25$			

Answers to Exercise Two

	Multiplication	Division	Division	"Say"
a)	8 x 4 = 32 4 x 8 = 32	32 ÷ 4 = 8 32 ÷ 8 = 4	$4\overline{)32}^{\,8}$ $8\overline{)32}^{\,4}$	32 divided by 4 is 8 32 divided by 8 is 4
b)	5 × 10 = 50 10 x 5 = 50	50 ÷ 10 = 5 50 ÷ 5 = 10	$10\overline{)50}^{\,5}$ $5\overline{)50}^{\,10}$	50 divided by 10 is 5 50 divided by 5 is 10
c)	2 × 3 = 6 3 x 2 = 6	6 ÷ 3 = 2 6 ÷ 2 = 3	$3\overline{)6}^{\,2}$ $2\overline{)6}^{\,3}$	6 divided by 3 is 2 6 divided by 2 is 3
d)	5 × 8 = 40 8 x 5 = 40	40 ÷ 8 = 5 40 ÷ 5 = 8	$8\overline{)40}^{\,5}$ $8\overline{)40}^{\,5}$	40 divided by 8 is 5 40 divided by 5 is 8
e)	3 × 4 = 12 4 x 3 = 12	12 ÷ 4 = 3 12 ÷ 3 = 4	$4\overline{)12}^{\,3}$ $3\overline{)12}^{\,4}$	12 divided by 4 is 3 12 divided by 3 is 4
f)	2 × 10 = 20 10 x 2 = 20	20 ÷ 10 = 2 20 ÷ 2 = 10	$10\overline{)20}^{\,2}$ $2\overline{)20}^{\,10}$	20 divided by 10 is 2 20 divided by 2 is 10
g)	9 × 8 = 72 8 x 9 = 72	72 ÷ 8 = 9 72 ÷ 9 = 8	$8\overline{)72}^{\,9}$ $9\overline{)72}^{\,8}$	72 divided by 8 is 9 72 divided by 9 is 8
h)	6 × 5 = 30 5 x 6 = 30	30 ÷ 5 = 6 40 ÷ 6 = 5	$5\overline{)30}^{\,6}$ $6\overline{)30}^{\,5}$	30 divided by 5 is 6 30 divided by 6 is 5
i)	7 × 4 = 28 4 x 7 = 28	28 ÷ 4 = 7 28 ÷ 7 = 4	$4\overline{)28}^{\,7}$ $7\overline{)28}^{\,4}$	28 divided by 4 is 7 28 divided by 7 is 4

	Multiplication	Division	Division	"Say"
j)	$10 \times 3 = 30$ $3 \times 10 = 30$	$30 \div 3 = 10$ $30 \div 10 = 3$	$3\overline{)30}$ 10 $10\overline{)30}$ 3	30 divided by 3 is 10 30 divided by 10 is 3
k)	$5 \times 5 = 25$ $5 \times 5 = 25$	$25 \div 5 = 5$ $25 \div 5 = 5$	$5\overline{)25}$ 5 $5\overline{)25}$ 5	25 divided by 5 is 5 25 divided by 5 is 5

Exercise Three

Check your division facts by **quickly** doing this exercise.
Check your work using the answer key at the end of the exercise.

a) $72 \div 6 =$ _____ b) $12 \div 2 =$ _____ c) $3 \div 1 =$ _____

d) $80 \div 10 =$ _____ e) $18 \div 6 =$ _____ f) $40 \div 4 =$ _____

g) $21 \div 7 =$ _____ h) $50 \div 5 =$ _____ i) $54 \div 9 =$ _____

j) $8 \div 2 =$ _____ k) $22 \div 11 =$ _____ l) $45 \div 9 =$ _____

m) $4 \div 4 =$ _____ n) $24 \div 6 =$ _____ o) $81 \div 9 =$ _____

p) $88 \div 8 =$ _____ q) $30 \div 3 =$ _____ r) $12 \div 4 =$ _____

s) $33 \div 3 =$ _____ t) $66 \div 11 =$ _____ u) $20 \div 5 =$ _____

v) $6 \div 2 =$ _____ w) $30 \div 6 =$ _____ x) $24 \div 12 =$ _____

Answers to Exercise Three

a) 12	b) 6	c) 3	d) 8	e) 3	f) 10	g) 3
h) 10	i) 6	j) 4	k) 2	l) 5	m) 1	n) 4
o) 9	p) 11	q) 10	r) 3	s) 11	t) 6	u) 4
v) 3	w) 5	x) 2				

Exercise Four

Check your division facts by **quickly** doing this exercise.
Check your work using the answer key at the end of the exercise.

a) $1\overline{)2}$ b) $10\overline{)100}$ c) $9\overline{)18}$

d) $5\overline{)5}$ e) $1\overline{)1}$ f) $4\overline{)44}$

g) $7\overline{)63}$ h) $5\overline{)35}$ i) $7\overline{)42}$

j) $12\overline{)96}$ k) $3\overline{)15}$ l) $10\overline{)10}$

m) $11\overline{)77}$ n) $8\overline{)16}$ o) $3\overline{)27}$

p) $1\overline{)8}$ q) $9\overline{)9}$ r) $2\overline{)14}$

s) $8\overline{)56}$ t) $10\overline{)60}$ u) $1\overline{)7}$

v) $9\overline{)108}$ w) $8\overline{)40}$ x) $11\overline{)11}$

Answers to Exercise Four

a) 2	b) 10	c) 2	d) 1	e) 1	f) 11	g) 9
h) 7	i) 6	j) 8	k) 5	l) 1	m) 7	n) 2
o) 9	p) 8	q) 1	r) 7	s) 7	t) 6	u) 7
v) 12	w) 5	x) 1				

Exercise Five

Check your division facts by **quickly** doing this exercise.
Check your work using the answer key at the end of the exercise.

a) 90 ÷ 10 = _____ b) 70 ÷ 7 = _____ c) 28 ÷ 7 = _____

d) 32 ÷ 8 = _____ e) 24 ÷ 3 = _____ f) 36 ÷ 12 = _____

g) 84 ÷ 7 = _____ h) 10 ÷ 2 = _____ i) 64 ÷ 8 = _____

j) 6 ÷ 6 = _____ k) 60 ÷ 12 = _____ l) 48 ÷ 4 = _____

m) 72 ÷ 9 = _____ n) 20 ÷ 10 = _____ o) 49 ÷ 7 = _____

p) 48 ÷ 6 = _____ q) 36 ÷ 9 = _____ r) 21 ÷ 3 = _____

s) $32 \div 4 =$ _____ t) $60 \div 6 =$ _____ u) $40 \div 4 =$ _____

v) $48 \div 8 =$ _____ w) $77 \div 7 =$ _____ v) $55 \div 11 =$ _____

Answers to Exercise Five

a) 9	b) 10	c) 4	d) 4	e) 8	f) 3	g) 12
h) 5	i) 8	j) 1	k) 5	l) 12	m) 8	n) 2
o) 7	p) 8	q) 4	r) 7	s) 8	t) 10	u) 10
v) 6	w) 11	x) 5				

Exercise Six

Check your division facts by **quickly** doing this exercise.
Check your work using the answer key at the end of the exercise.

a) $5\overline{)40}$ b) $2\overline{)18}$ c) $12\overline{)108}$

d) $4\overline{)24}$ e) $11\overline{)110}$ f) $5\overline{)25}$

g) $12\overline{)84}$ h) $3\overline{)12}$ i) $5\overline{)45}$

j) $8\overline{)72}$ k) $6\overline{)54}$ l) $11\overline{)99}$

m) $5\overline{)60}$ n) $4\overline{)16}$ o) $3\overline{)36}$

p) $5\overline{)15}$ q) $4\overline{)36}$ r) $2\overline{)24}$

s) $12\overline{)132}$ t) $2\overline{)16}$ u) $3\overline{)9}$

v) $10\overline{)30}$ w) $11\overline{)121}$ x) $6\overline{)36}$

Answers to Exercise Six

a) 8	b) 9	c) 9	d) 6	e) 10	f) 5	g) 7
h) 4	i) 9	j) 9	k) 9	l) 9	m) 12	n) 4
o) 12	p) 3	q) 9	r) 12	s) 11	t) 8	u) 3
v) 3	w) 11	x) 6				

Exercise Seven

Check your division facts by **quickly** doing this exercise.
Check your work using the answer key at the end of the exercise.

a) $12 \div 6 =$ _____ b) $27 \div 9 =$ _____ c) $56 \div 7 =$ _____

d) $3 \div 1 =$ _____ e) $20 \div 2 =$ _____ f) $9 \div 3 =$ _____

g) $55 \div 5 =$ _____ h) $14 \div 7 =$ _____ i) $42 \div 6 =$ _____

j) $18 \div 3 =$ _____ k) $88 \div 11 =$ _____ l) $63 \div 9 =$ _____

m) $28 \div 4 =$ _____ n) $6 \div 1 =$ _____ o) $30 \div 5 =$ _____

p) $4 \div 2 =$ _____ q) $7 \div 7 =$ _____ r) $48 \div 12 =$ _____

s) 35 ÷ 7 = _____ t) 96 ÷ 8 = _____ u) 20 ÷ 4 = _____

v) 24 ÷ 8 = _____ w) 72 ÷12 = _____ x) 6 ÷ 3 = _____

Answers to Exercise Seven

a) 2	b) 3	c) 8	d) 3	e) 10	f) 3	g) 11
h) 2	i) 7	j) 6	k) 8	l) 7	m) 7	n) 6
o) 7	p) 2	q) 1	r) 4	s) 5	t) 12	u) 5
v) 7	w) 6	x) 2				

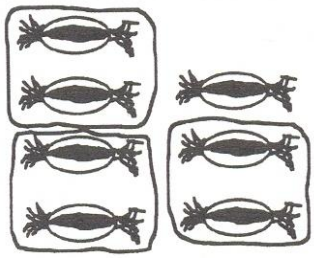
Make a list of any errors that you made and of the facts that you had to really think about. If you have any more than 5 facts on your list, ask your instructor for suggestions on learning and drilling the division facts.

Remainders

You have been practicing the division facts that always work out evenly – nothing is left over.

Well, in the real world things are not usually so perfect!

You have 7 candies to share among your 3 children.



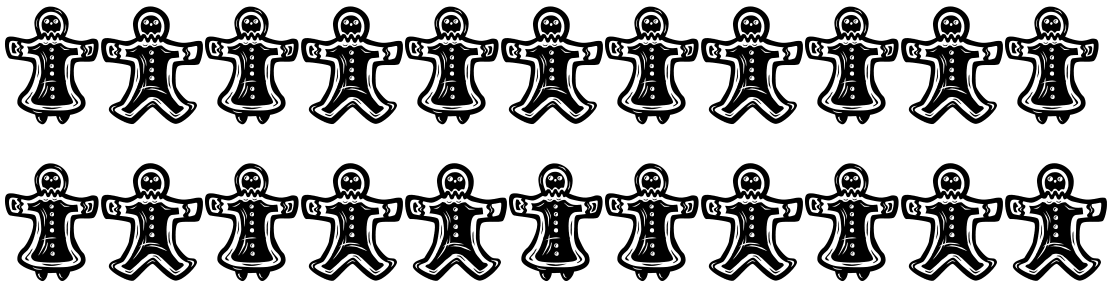
2 each and 1 candy left over

We call the left-over the **remainder**. For now, put **R** and the left over number after your quotient.

$7 \div 3 = 2 \text{ R } 1$ $\qquad$ $3\overline{)7}$ $\begin{matrix} 2 \\ \text{R } 1 \end{matrix}$

Here are 22 cookies. Circle groups of 5. How many groups of 5 in 22?

$22 \div 5 =$ _____



You should have 4 groups with 2 left over.

$22 \div 5 = 4 \text{ R } 2$ $\qquad$ $5\overline{)22}$ $\begin{matrix} 4 \\ \text{R } 2 \end{matrix}$

The remainder must not be the same size or bigger than the divisor. If it is bigger, it means another group could be made.

Here are 66 suns. Make groups of 9. How many groups? ____

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How many left over? _____

66 ÷ 9 = 7 R 3 $\qquad$ $9\overline{)66}$ $\begin{matrix}7\\ \text{R } 3\end{matrix}$

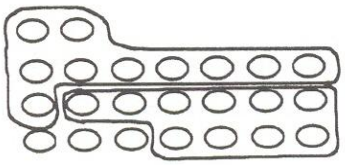
The remainder must **not** be the same size or bigger than the divisor. Why not? It would make another group.

Exercise Eight

Draw pictures to find the quotient and the remainder. Write each question using the other division sign as well. Have your instructor check your work.

a) 23 ÷ 10 = *2 R 3*

$10\overline{)23}$ $\begin{matrix}2\\ \text{R } 3\end{matrix}$



b) 24 ÷ 7 = _____

c) 19 ÷ 3 = _____

d) 39 ÷ 12 = _____

e) 14 ÷ 4 = _____

You cannot always draw pictures, so how should you find the quotients?

Example A: $29 \div 3 =$ _____

- Use multiplication tables or the division facts to find a **trial quotient**. What can you multiply by 3 to find a number close to 29?

  $3 \times 9 = 27$ ✓
  $3 \times 10 = 30$

  Use 9 as the **trial quotient**. Do not use 10 because $3 \times 10 = 30$ which is more than the dividend 29.

- **Divide** $3\overline{)29}$ → $\begin{array}{r} 9 \\ 3\overline{)29} \end{array}$

- **Multiply** $9 \times 3 = 27$ Write the product under the 29.

$$\begin{array}{r} 9 \\ 3\overline{)29} \\ \underline{27} \\ 2 \end{array}$$

- **Subtract** 27 from 29 to find the remainder.

- **Check (compare)** to be sure the remainder is less then (<) the divisor.

  $2 < 3$ ✓ $29 \div 3 = 9$ R 2

Example B: $60 \div 7 =$ _____ $7\overline{)60}$

- Think what can be multiplied by 7 to find a number close to 60.
  $7 \times 8 = 56$ ✓
  $7 \times 9 = 63$ too big

- **Divide** $\begin{array}{r} 8 \\ 7\overline{)60} \end{array}$

- **Multiply**

$$\begin{array}{r} 8 \\ 7\overline{)60} \\ \underline{56} \\ 4 \end{array}$$

- **Subtract** $60 - 56 = 4$

- **Compare** to be sure the remainder is less than the divisor.
  $4 < 7$ ✓ $60 \div 7 = 8$ R 4

Exercise Nine

Find the quotients and remainders (divide, multiply, subtract, compare.) Check your work using the answer key at the end of the exercise.

a) $5\overline{)28}$ b) $4\overline{)15}$ c) $6\overline{)47}$

d) $9\overline{)37}$ e) $2\overline{)13}$ f) $6\overline{)25}$

g) $8\overline{)75}$ h) $3\overline{)19}$ i) $7\overline{)32}$

j) $4\overline{)9}$ k) $9\overline{)55}$ l) $10\overline{)98}$

m) $3\overline{)26}$ n) $8\overline{)47}$ o) $9\overline{)46}$

p) $6\overline{)43}$ q) $5\overline{)49}$ r) $4\overline{)38}$

s) $2\overline{)19}$ t) $7\overline{)61}$ u) $3\overline{)23}$

v) $8\overline{)78}$ w) $9\overline{)67}$ x) $6\overline{)45}$

Answers to Exercise Nine

a) 5 R3	b) 3 R3	c) 7 R5	d) 4 R1	e) 6 R1	f) 4 R1	g) 9 R3
h) 6 R1	i) 4 R4	j) 2 R1	k) 6 R1	l) 9 R8	m) 8 R2	n) 5 R7
o) 5 R1	p) 7 R1	q) 9 R4	r) 9 R2	s) 9 R1	t) 8 R5	u) 7 R2
v) 9 R6	w) 7 R4	x) 7 R3				

Exercise Ten

Find the quotients and remainders (divide, multiply, subtract, compare.) Check your work using the answer key at the end of the exercise.

a) $5\overline{)44}$ b) $8\overline{)63}$ c) $9\overline{)80}$

d) $10\overline{)65}$ e) $3\overline{)22}$ f) $7\overline{)55}$

g) $4\overline{)39}$

h) $8\overline{)58}$

i) $6\overline{)41}$

j) $8\overline{)76}$

k) $5\overline{)47}$

l) $4\overline{)27}$

m) $6\overline{)53}$

n) $7\overline{)67}$

o) $9\overline{)78}$

p) $5\overline{)33}$

q) $9\overline{)64}$

r) $10\overline{)81}$

s) $2\overline{)19}$

t) $3\overline{)29}$

u) $6\overline{)51}$

v) $10\overline{)78}$

w) $7\overline{)68}$

x) $4\overline{)17}$

Answers to Exercise Ten

a) 8 R4	b) 7 R7	c) 8 R8	d) 6 R5	e) 7 R1	f) 7 R6	g) 9 R3
h) 7 R2	i) 6 R5	j) 9 R4	k) 9 R2	l) 6 R3	m) 8 R5	n) 9 R4
o) 8 R6	p) 6 R3	q) 7 R1	r) 8 R1	s) 9 R1	t) 9 R2	u) 8 R3
v) 7 R8	w) 9 R5	x) 4 R1				

Exercise Eleven

Find the quotients and remainders (divide, multiply, subtract, compare.) Check your work using the answer key at the end of the exercise.

Example: **59 ÷ 7 =**

Rewrite: $7\overline{)59}$

Then solve:

$$\begin{array}{r} 8 \\ 7\overline{)59} \\ 56 \\ \hline 3 \end{array}$$

Answer: 8 R3

a) 27 ÷ 5 =

b) 13 ÷ 2 =

c) 46 ÷ 9 =

d) 38 ÷ 6 =

e) 61 ÷ 7 =

f) 14 ÷ 5 =

g) 49 ÷ 8 =

h) 28 ÷ 3 =

i) 78 ÷ 8 =

j) 37 ÷ 4 =

k) 67 ÷ 9 =

l) 52 ÷ 6 =

m) 45 ÷ 8 =

n) 25 ÷ 7 =

o) 11 ÷ 3 =

p) 53 ÷ 9 =

q) 19 ÷ 4 =

r) 77 ÷ 8 =

s) $20 \div 3 =$

t) $11 \div 2 =$

u) $23 \div 5 =$

v) $54 \div 7 =$

w) $87 \div 9 =$

x) $9 \div 4 =$

Answers to Exercise Eleven

a) 5 R2	b) 6 R1	c) 5 R1	d) 6 R2	e) 8 R5	f) 2 R4	g) 6 R1
h) 9 R1	i) 9 R6	j) 9 R1	k) 7 R4	l) 8 R4	m) 5 R5	n) 3 R4
o) 3 R2	p) 5 R8	q) 4 R3	r) 9 R5	s) 6 R2	t) 5 R1	u) 4 R3
v) 7 R5	w) 9 R6	x) 2 R1				

Topic A: Self-Test

Mark /12 **Aim 9/12**

A. Give the answer. **6 marks**

a) $63 \div 9 =$ _____ b) $21 \div 7 =$ _____ c) $72 \div 8 =$ _____

d) $6\overline{)54}$ e) $8\overline{)64}$ f) $7\overline{)56}$

B. Find the quotient. **6 marks**

a) $6\overline{)59}$ b) $9\overline{)87}$ c) $7\overline{)51}$

d) $8\overline{)76}$ e) $5\overline{)49}$ f) $3\overline{)26}$

Answers to Topic A Self-Test

A.

a) 7 b) 3 c) 9 d) 9 e) 8 f) 8

B.

a) 9 R5 b) 9 R6 c) 7 R2 d) 9 R4 e) 9 R4 f) 8 R2

Topic B: Divisibility

Divisibility is when two numbers can be divided without a remainder.

For example, 18 is divisible by 3 because $18 \div 3 = 6$.
18 is not divisible by 5 because $18 \div 5 = 3$ with a remainder of 3.

Divisibility by 2

A number is divisible by 2 if it ends in 0, 2, 4, 6 or 8.

> **Example A:** 438, 540, 256, 12, 154 are all divisible by 2 because each number ends in a 0, 2, 4, 6 or 8.
>
> **Example B:** 351, 945, 849, 347,193 are not divisible by 2 because each number **does not** end in a 0, 2, 4, 6 or 8.

Exercise One

Circle the numbers that are divisible by 2. Check your work using the answer key at the end of the exercise.

a) 22	b) 35	c) 17
d) 10	e) 274	f) 345
g) 639	h) 456	i) 2 437
j) 7 548	k) 6 754	l) 5 543

Answers to Exercise One

a) 22 d) 10 e) 274 h) 456 j) 7 548 k) 6 754

Divisibility by 3

A number is divisible by 3 if the sum (total) of the digits is divisible by 3.

Example A: 63

$6+3=9$

9 is divisible by 3, so 63 is divisible by 3.

Example B: 148

$1+4+8=13$

13 is not divisible by 3, so 148 is not divisible by 3.

Example C: 5 892

$5+8+9+2=24$

Add again: $2+4=6$

6 is divisible by 3, so 5 892 is divisible by 3.

Exercise Two

Circle the numbers that are divisible by 3. Check your work using the answer key at the end of the exercise.

a) 27	b) 35	c) 81
d) 94	e) 274	f) 581
g) 564	h) 316	i) 3 175
j) 1 458	k) 1 890	l) 3 934

Answers to Exercise Two

a) 27 c) 81 g) 564 j) 1 458 k) 1 890

Divisibility by 5

A number is divisible by 5 if the number ends in 0 or 5.

Example A: 290 is divisible by 5 because it ends in 0.

Example B: 132 is not divisible by 5 because it does not end in 0 or 5.

Exercise Three

Circle the numbers that are divisible by 5. Check your work using the answer key at the end of the exercise.

a) 45	b) 84	c) 72
d) 90	e) 800	f) 753
g) 672	h) 355	i) 6 009
j) 6 375	k) 7 020	l) 1 704

Answers to Exercise Three

a) 45 d) 90 e) 800 h) 355 j) 6 375 k) 7 020

Exercise Four

Put a check mark for each number that divides evenly.
Check your work using the answer key at the end of the exercise.

	Number	2	3	5
a	474			
b	615			
c	412			
d	865			
e	300			
f	831			
g	525			
h	350			
i	710			
j	429			
k	906			
l	634			
m	430			
n	275			

Answers to Exercise Four

	Number	2	3	5
a	474	√	√	
b	615		√	√
c	412	√		
d	865			√
e	300	√	√	√
f	831		√	
g	525		√	√
h	350	√	√	√
i	710	√		√
j	429		√	
k	906	√	√	
l	634	√		
m	430	√		√
n	275			√

Exercise Five

Put a check mark for each number that divides evenly. Check your work using the answer key at the end of the exercise.

	Number	2	3	5
a	3 585			
b	7 548			
c	5 890			
d	6 318			
e	3 905			
f	5 280			
g	1 760			
h	8 007			
i	6 752			
j	7 375			
k	5 523			
l	2 625			
m	8 956			
n	9 150			

Answers to Exercise Five

	Number	2	3	5
a	3 585		√	√
b	7 548	√	√	
c	5 890	√		√
d	6 318	√	√	
e	3 905			√
f	5 280	√	√	√
g	1 760	√		√
h	8 007		√	
i	6 752	√		
j	7 375			√
k	5 532		√	
l	2 625		√	√
m	8 956	√		
n	9 150	√	√	√

Divisibility by 9

A number is divisible by 9 if the sum (total) of the digits is divisible by 9.

Example A: 135

$1+3+5=9$

9 is divisible by 9, so 135 is divisible by 9.

Example B: 7 578

$7+5+7+8=27$

27 is divisible by 9, so 7 578 is divisible by 9.

Example C: 57 896

$5+7+8+9+6=35$

35 is not divisible by 9, so 57 896 is divisible by 9.

Exercise Six

Circle the numbers that are divisible by 3. Check your work using the answer key at the end of the exercise.

a) 538	b) 783	c) 954
d) 762	e) 6 213	f) 5 742
g) 7 083	h) 5 738	i) 34 937
j) 39 402	k) 74 124	l) 45 683

Answers to Exercise Six

b) 783 c) 954 f) 5 742 g) 7 083 j) 39 402 k) 74 124

Exercise Seven

Put a check mark for each number that divides evenly. Check your work using the answer key at the end of the exercise.

	Number	2	3	5	9
a	453				
b	320				
c	216				
d	726				
e	712				
f	425				
g	630				
h	375				
i	990				
j	210				

Answers to Exercise Seven

	Number	2	3	5	9
a	453		√		
b	320	√		√	
c	216	√	√		√
d	726	√	√		
e	712	√			
f	425			√	
g	630	√	√	√	√
h	375		√	√	
i	990		√	√	√
j	210	√	√	√	

Exercise Eight

Put a check mark for each number that divides evenly. Check your work using the answer key at the end of the exercise.

	Number	2	3	5	9
a	837				
b	360				
c	648				
d	981				
e	465				
f	1 002				
g	3 520				
h	6 435				
i	8 022				
j	7 425				

Answers to Exercise Eight

	Number	2	3	5	9
a	837		√		√
b	360	√	√	√	√
c	648	√	√		√
d	981		√		√
e	465		√	√	
f	1 002	√	√		
g	3 520	√		√	
h	6 435		√	√	√
i	8 022	√	√		
j	7 425		√	√	√

Exercise Nine

Put a check mark for each number that divides evenly. Check your work using the answer key at the end of the exercise.

	Number	2	3	5	9
a	1 200				
b	7 164				
c	3 681				
d	8 205				
e	2 745				
f	4 320				
g	7 350				
h	4 000				
i	1 368				
j	6 720				

Answers to Exercise Nine

	Number	2	3	5	9
a	1 200	√	√	√	
b	7 164	√	√		√
c	3 681		√		√
d	8 205		√	√	
e	2 745		√	√	√
f	4 320	√	√	√	√
g	7 350	√	√	√	
h	4 000	√		√	
i	1 368	√	√		√
j	6 720	√	√	√	

Topic B: Self-Test

Mark /12 Aim 9/12

A. From the list of numbers, write the numbers. **6 marks**

48, 925, 1 467, 2 645, 5 534, 7 512, 31 183, 52 361

a) Which numbers are divisible by 2?

b) Which numbers are divisible by 3?

c) Which numbers are divisible by 5?

d) Which numbers are divisible by 9?

B. Put a check mark for each number that divides evenly. **6 marks**

	Number	**2**	**3**	**5**	**9**
a	1 200				
b	7 164				
c	3 681				
d	8 205				
e	2 745				

Answers to Topic B Self-Test

A.

a) 48, 7 512, 5 534 b) 48, 1 467, 7 512 c) 925, 2 645

d) 1 467

B.

	Number	2	3	5	9
a	1 200	√	√	√	
b	7 164	√	√		√
c	3 681		√		√
d	8 205		√	√	
e	2 745		√	√	√

Topic C: Dividing Larger Numbers by One Digit Divisors

Several methods are used to divide larger numbers. This book will only teach one method. If you have learned a different method for dividing, ask your instructor to review it with you. You can use the practice exercises in this workbook using whichever method you prefer.

Division has four steps which are repeated until the dividend is completely divided. Work through the three examples which show these steps.

Step 1: Divide

Step 2: Multiply

Step 3: Subtract and **compare** the remainder to the divisor

Step 4: Bring down the next digit in the dividend and **repeat.**

Example A: $294 \div 7 =$ _____ Rewrite as $7\overline{)294}$

Step 1: **Divide**.

- You are finding a trial quotient using the multiplication tables or division facts.
- Look at the dividend one digit at a time.
- The first digit is a 2, which is really 2 hundreds.
- Will 7 "go into" 2 – can you divide 2 by 7? **NO**.
- Look at the first 2 digits, 29, which is really 29 tens.
- Will 7 go into 29? **YES**. ($4 \times 7 = 28$)
- The first number in the trial quotient is **4. Place the 4 in the quotient directly above the 9 tens.** The 4 is 4 tens in the quotient.

$$7\overline{)\begin{array}{r}4\\294\end{array}}$$

Step 2: Multiply $4 \times 7 = 28$
Write the 28 under the 29. Draw a line.

$$7\overline{)\begin{array}{r}4\\294\\\underline{28}\end{array}}$$

Step 3: **Subtract** $29 - 28 = 1$ (ten) and check $1 < 7$ ✓

$$\begin{array}{r} 4 \\ 7\overline{)294} \\ \underline{28} \\ 1 \end{array}$$

Step 4: Bring down the next number in the dividend (4) and you have 14. This **14 is the number that you must now divide.**

$$\begin{array}{r} 4 \\ 7\overline{)294} \\ \underline{28}\downarrow \\ 14 \end{array}$$

REPEAT

Step 1: **Divide** $14 \div 7 = 2$
Put the 2 in the quotient right after the 4 in the ones place.

$$\begin{array}{r} 42 \\ 7\overline{)294} \\ \underline{28}\downarrow \\ 14 \end{array}$$

Step 2: **Multiply** $2 \times 7 = 14$
Write the 14 under the 14.

$$\begin{array}{r} 42 \\ 7\overline{)294} \\ \underline{28}\downarrow \\ 14 \\ \underline{14} \end{array}$$

Step 3: **Subtract** $14 - 14 = 0$
There is 0 remainder. Check $0 < 7$ ✓

$$\begin{array}{r} 42 \\ 7\overline{)294} \\ \underline{28}\downarrow \\ 14 \\ \underline{14} \\ 0 \end{array}$$

Step 4: No more numbers in the dividend to bring down.

Example B: $128 \div 2 =$ _____

$$2\overline{)128}$$

$$\begin{array}{r} 6 \\ 2\overline{)128} \\ \underline{12}\downarrow \\ 08 \end{array}$$

$$\begin{array}{r} 64 \\ 2\overline{)128} \\ \underline{12}\downarrow \\ 08 \\ \underline{8} \\ 0 \end{array}$$

Step 1: Divide

- Can 2 "go into" 1? **NO**
- Can 2 go into 12? **YES**
- How many times?

$2 \times 6 = 12$ $12 \div 2 = 6$

The first number in the trial quotient is **6**. Put the 6 in the quotient directly above the 2 tens in the dividend.

Step 2: Multiply $6 \times 2 = 12$

Step 3: Subtract $12 - 12 = 0$

Check $0 < 12$ ✓

Step 4: Bring down the next digit in the dividend (8). **8** is now the number to be divided.

REPEAT

Divide $8 \div 2 = 4$

Multiply $4 \times 2 = 8$

Subtract $8 - 8 = 0$

Check $0 < 2$ ✓

Bring down the next digit.

No more digits in the dividend.

$128 \div 2 = 64$

Exercise One

Find the quotients (divide, multiply, subtract, compare).
Check your work using the answer key at the end of the exercise.

a) $4\overline{)364}$ b) $2\overline{)144}$ c) $5\overline{)455}$

d) $7\overline{)651}$ e) $8\overline{)144}$ f) $2\overline{)166}$

g) $7\overline{)588}$ h) $2\overline{)196}$ i) $5\overline{)230}$

j) $8\overline{)584}$ k) $6\overline{)366}$ l) $4\overline{)244}$

m) $5\overline{)375}$ n) $8\overline{)200}$ o) $2\overline{)628}$

p) $7\overline{)357}$ q) $9\overline{)837}$ r) $8\overline{)248}$

s) $8\overline{)312}$ t) $7\overline{)462}$ u) $5\overline{)295}$

v) $6\overline{)384}$ w) $2\overline{)276}$ x) $4\overline{)372}$

Answers to Exercise One

a) 91	b) 72	c) 91	d) 93	e) 18	f) 83	g) 84
h) 98	i) 46	j) 73	k) 61	l) 61	m) 75	n) 25
o) 314	p) 51	q) 93	r) 31	s) 39	t) 66	u) 59
v) 64	w) 138	x) 93				

Exercise Two

Find the quotients (divide, multiply, subtract, compare).
Check your work using the answer key at the end of the exercise.

a) $4\overline{)248}$ b) $4\overline{)184}$ c) $5\overline{)420}$

d) $9\overline{)576}$ e) $7\overline{)427}$ f) $6\overline{)486}$

g) $3\overline{)189}$ h) $7\overline{)266}$ i) $8\overline{)472}$

j) $7\overline{)784}$ k) $3\overline{)768}$ l) $8\overline{)296}$

m) $9\overline{)315}$ n) $6\overline{)252}$ o) $3\overline{)249}$

p) $6\overline{)426}$ q) $7\overline{)406}$ r) $8\overline{)248}$

s) $5\overline{)355}$ t) $6\overline{)462}$ u) $2\overline{)196}$

v) $8\overline{)184}$ w) $5\overline{)930}$ x) $3\overline{)186}$

Answers to Exercise Two

a) 62	b) 46	c) 84	d) 64	e) 61	f) 81	g) 63
h) 38	i) 59	j) 112	k) 256	l) 37	m) 35	n) 42
o) 83	p) 71	q) 58	r) 31	s) 71	t) 77	u) 98
v) 23	w) 186	x) 62				

Example C: $856 \div 8 =$ _____ $8\overline{)856}$

Divide Does 8 go into 8? **YES**
$8 \div 8 = 1$

$$8\overline{)\begin{array}{r}1\\856\end{array}}$$

Multiply $1 \times 8 = 8$

$$8\overline{)\begin{array}{r}1\\856\\\underline{8}\end{array}}$$

Subtract $8 - 8 = 0$
Check $0 < 8$ ✓

$$8\overline{)\begin{array}{r}1\\856\\\underline{8}\\0\end{array}}$$

Bring down the next digit. 5 is now the number to be divided.

$$8\overline{)\begin{array}{r}1\\856\\\underline{8}\downarrow\\05\end{array}}$$

REPEAT

Divide 8 goes into 5? **NO**

You must put a zero to hold the place in the quotient. If a digit is brought down, a digit must be placed in the quotient.

$$\begin{array}{r} 10 \\ 8\overline{)856} \\ \underline{8}\downarrow \\ 05 \end{array}$$

Multiply $0 \times 8 = 0$

$$\begin{array}{r} 10 \\ 8\overline{)856} \\ \underline{8}\downarrow \\ 05 \\ \underline{0} \end{array}$$

Subtract $5 - 0 = 5$

Check $5 < 8$ ✓

$$\begin{array}{r} 10 \\ 8\overline{)856} \\ \underline{8}\downarrow\downarrow \\ 05\downarrow \\ \underline{0}\downarrow \\ 5 \end{array}$$

Bring down the next digit. 56 is now the number to be divided.

$$\begin{array}{r} 10 \\ 8\overline{)856} \\ \underline{8}\downarrow\downarrow \\ 05\downarrow \\ \underline{0}\downarrow \\ 56 \end{array}$$

REPEAT

Divide 8 goes into 56? **YES**

$56 \div 8 = 7$

Write 7 in the quotient in the ones place above the 6 in the dividend.

$$\begin{array}{r} 107 \\ 8\overline{)856} \\ \underline{8\downarrow\downarrow\downarrow} \\ 05\downarrow \\ \underline{0\downarrow} \\ 56 \\ \underline{56} \\ 0 \end{array}$$

Multiply $7 \times 8 = 56$

$$\begin{array}{r} 107 \\ 8\overline{)856} \\ \underline{8\downarrow\downarrow\downarrow} \\ 05\downarrow \\ \underline{0\downarrow} \\ 56 \\ \underline{56} \end{array}$$

Subtract $56 - 56 = 0$

Check $0 < 8$ ✓

$$\begin{array}{r} 107 \\ 8\overline{)856} \\ \underline{8\downarrow\downarrow\downarrow} \\ 05\downarrow \\ \underline{0\downarrow} \\ 56 \\ \underline{56} \\ 0 \end{array}$$

Bring down No more digits.

Exercise Three

Find the quotients (divide, multiply, subtract, compare).
Check your work using the answer key at the end of the exercise.

a) $7\overline{)721}$ b) $9\overline{)954}$ c) $3\overline{)927}$

d) $3\overline{)621}$ e) $4\overline{)824}$ f) $9\overline{)972}$

g) $7\overline{)714}$ h) $2\overline{)416}$ i) $5\overline{)540}$

j) $6\overline{)654}$ k) $8\overline{)832}$ l) $4\overline{)436}$

m) $5\overline{)515}$ n) $2\overline{)814}$ o) $6\overline{)648}$

p) $8\overline{)856}$ q) $5\overline{)525}$ r) $7\overline{)763}$

s) $9\overline{)945}$ t) $3\overline{)315}$ u) $8\overline{)872}$

v) $4\overline{)416}$ w) $6\overline{)618}$ x) $2\overline{)612}$

Answers to Exercise Three

a) 103	b) 106	c) 309	d) 207	e) 206	f) 108	g) 102
h) 208	i) 108	j) 109	k) 104	l) 109	m) 103	n) 407
o) 108	p) 107	q) 105	r) 109	s) 105	t) 105	u) 109
v) 104	w) 103	x) 306				

Exercise Four

Find the quotients (divide, multiply, subtract, compare).
Check your work using the answer key at the end of the exercise.

a) $6\overline{)624}$ b) $4\overline{)832}$ c) $8\overline{)864}$

d) $2\overline{)608}$ e) $5\overline{)545}$ f) $7\overline{)749}$

g) $9\overline{)918}$ h) $3\overline{)303}$ i) $8\overline{)840}$

j) $4\overline{)412}$ k) $6\overline{)630}$ l) $9\overline{)936}$

m) $5\overline{)520}$ n) $7\overline{)735}$ o) $2\overline{)802}$

p) $3\overline{)924}$ q) $5\overline{)510}$ r) $4\overline{)808}$

s) $8\overline{)848}$ t) $2\overline{)410}$ u) $6\overline{)642}$

v) $7\overline{)756}$ w) $9\overline{)963}$ x) $3\overline{)618}$

Answers to Exercise Four

a) 104	b) 208	c) 108	d) 304	e) 109	f) 107	g) 106
h) 101	i) 105	j) 103	k) 105	l) 104	m) 104	n) 105
o) 401	p) 308	q) 102	r) 202	s) 106	t) 205	u) 107
v) 108	w) 107	x) 206				

One Digit Divisors with Remainders

Do the division exactly the same way that you have been learning. Often there is a remainder after the last subtraction. Write it with the quotient as you already know how to do.

Example 259 ÷ 8 = _____

$$\begin{array}{r} 32 \text{ R } 3 \\ 8\overline{)259} \\ \underline{24\downarrow} \\ 19 \\ \underline{16} \\ 3 \end{array}$$

259 ÷ 8 = 32 R 3

Exercise Five

Divide and show any remainders. Check your work using the answer key at the end of the exercise.

a) $2\overline{)93}$ b) $3\overline{)52}$ c) $5\overline{)94}$

d) $7\overline{)74}$ e) $4\overline{)95}$ f) $9\overline{)96}$

g) $6\overline{)97}$ h) $8\overline{)99}$ i) $9\overline{)98}$

j) $4\overline{)59}$ k) $6\overline{)76}$ l) $3\overline{)79}$

m) $7\overline{)96}$ n) $5\overline{)57}$ o) $2\overline{)47}$

p) $8\overline{)91}$ q) $7\overline{)89}$ r) $6\overline{)82}$

s) $5\overline{)67}$ t) $2\overline{)85}$ u) $4\overline{)71}$

v) $3\overline{)65}$ w) $9\overline{)92}$ x) $8\overline{)94}$

Answers to Exercise Five

a)	46 R1	b)	17 R1	c)	18 R4	d)	10 R4	e)	23 R3	f)	10 R6	g)	16 R1
h)	12 R3	i)	10 R8	j)	14 R3	k)	12 R4	l)	26 R1	m)	13 R5	n)	11 R2
o)	23 R1	p)	11 R3	q)	12 R5	r)	13 R4	s)	13 R2	t)	42 R1	u)	17 R3
v)	21 R2	w)	10 R2	x)	11 R6								

To check your division, do this:

- multiply quotient × divisor
- add on any remainder
- the product will equal the dividend if your arithmetic is correct.

Example

$$\begin{array}{r} 52 \text{ R } 1 \\ 9\overline{)469} \\ \underline{45}\downarrow \\ 19 \\ \underline{18} \\ 1 \end{array} \qquad \begin{array}{r} 52 \\ \times\ 9 \\ \hline 468 \\ \\ +\ 1 \\ \hline \end{array}$$

Exercise Six

Divide and check your answer by multiplying. Check your work using the answer key at the end of the exercise.

a) $6\overline{)68}$ b) $4\overline{)85}$ c) $7\overline{)87}$

d) $5\overline{)78}$ e) $2\overline{)59}$ f) $8\overline{)92}$

g) $3\overline{)49}$ h) $9\overline{)91}$ i) $4\overline{)62}$

j) $8\overline{)89}$ k) $6\overline{)80}$ l) $2\overline{)73}$

m) $7\overline{)78}$ n) $5\overline{)61}$ o) $3\overline{)86}$

p) $9\overline{)95}$ q) $8\overline{)98}$ r) $6\overline{)75}$

s) $4\overline{)49}$ t) $7\overline{)99}$ u) $5\overline{)83}$

v) $2\overline{)31}$ w) $3\overline{)94}$ x) $9\overline{)97}$

Answers to Exercise Six

a)	11 R2	b)	21 R1	c)	12 R3	d)	15 R3	e)	29 R1	f)	11 R4	g)	16 R1
h)	10 R1	i)	15 R2	j)	11 R1	k)	13 R2	l)	36 R1	m)	11 R1	n)	12 R1
o)	28 R2	p)	10 R5	q)	12 R2	r)	12 R3	s)	12 R1	t)	14 R1	u)	16 R3
v)	15 R1	w)	31 R1	x)	10 R7								

Exercise Seven

Divide and check your answer by multiplying. Check your work using the answer key at the end of the exercise.

a) $7\overline{)709}$ b) $2\overline{)423}$ c) $5\overline{)538}$

d) $4\overline{)609}$ e) $9\overline{)406}$ f) $6\overline{)125}$

g) $3\overline{)605}$ h) $9\overline{)928}$ i) $3\overline{)962}$

j) $4\overline{)805}$ k) $8\overline{)301}$ l) $2\overline{)807}$

m) $6\overline{)725}$ n) $7\overline{)320}$ o) $9\overline{)140}$

p) $8\overline{)483}$ q) $2\overline{)197}$ r) $6\overline{)307}$

s) $5\overline{)504}$ t) $8\overline{)709}$ u) $7\overline{)876}$

v) $4\overline{)101}$ w) $3\overline{)269}$ x) $5\overline{)473}$

Answers to Exercise Seven

a)	101 R2	b)	211 R1	c)	107 R3	d)	152 R1	e)	45 R1	f)	20 R5	g)	201 R2
h)	103 R1	i)	320 R2	j)	201 R1	k)	37 R5	l)	403 R1	m)	120 R5	n)	45 R5
o)	15 R5	p)	60 R3	q)	98 R1	r)	51 R1	s)	100 R4	t)	88 R5	u)	125 R1
v)	25 R1	w)	89 R2	x)	94 R3								

Exercise Eight

Divide and check your answer for by multiplying. Check your work using the answer key at the end of the exercise.

a) $8\overline{)105}$ b) $6\overline{)256}$ c) $2\overline{)563}$

d) $9\overline{)546}$ e) $4\overline{)375}$ f) $5\overline{)243}$

g) $3\overline{)416}$ h) $9\overline{)682}$ i) $7\overline{)251}$

j) $6\overline{)819}$ k) $7\overline{)657}$ l) $8\overline{)878}$

m) $2\overline{)759}$ n) $5\overline{)758}$ o) $3\overline{)821}$

p) $4\overline{)758}$ q) $9\overline{)264}$ r) $6\overline{)541}$

s) $7\overline{)426}$ t) $3\overline{)571}$ u) $2\overline{)645}$

v) $5\overline{)961}$ w) $8\overline{)993}$ x) $4\overline{)917}$

Answers to Exercise Eight

a)	13 R1	b)	42 R4	c)	281 R1	d)	60 R6	e)	93 R3	f)	48 R3	g)	138 R2
h)	75 R7	i)	35 R6	j)	136 R3	k)	93 R6	l)	109 R6	m)	379 R1	n)	151 R3
o)	273 R2	p)	189 R2	q)	29 R3	r)	90 R1	s)	60 R6	t)	190 R1	u)	322 R1
v)	192 R1	w)	124 R1	x)	229 R1								

Topic C: Self-Test

Mark /24 **Aim 19/24**

A. Find the quotient. **6 marks**

a) $6\overline{)96}$ b) $4\overline{)92}$ c) $7\overline{)91}$

d) $2\overline{)93}$ e) $5\overline{)94}$ f) $3\overline{)52}$

B. Divide. **6 marks**

a) $7\overline{)182}$ b) $8\overline{)736}$ c) $6\overline{)162}$

d) $5\overline{)295}$ e) $4\overline{)184}$ f) $9\overline{)576}$

C. Divide and show your check for each answer. **12 marks**
(1 mark for question, 1 mark for check)

a) $9\overline{)705}$

b) $4\overline{)257}$

c) $7\overline{)899}$

d) $5\overline{)538}$

e) $8\overline{)876}$

f) $6\overline{)628}$

Answers to Topic C Self-Test

A.

a) 16 b) 23 c) 13 d) 46 R1 e) 18 R4 f) 17 R1

B.

a) 26 b) 92 c) 27 d) 59 e) 46 f) 64

C.

a) 78 R3 b) 64 R1 c) 128 R3 d) 107 R3 e) 109 R4 f) 104 R4

Topic D: Dividing by Two and Three Digit Divisors

Finding Trial Quotients:

When dividing by 2-digit numbers, you will need to **estimate** the quotient. This guess is called a **trial quotient**.

Example A: $624 \div 24$

Step 1: Divide

$$24\overline{)624}$$

Think: $2\overline{)6}$ is 3. So $24\overline{)62}$ is about 3.

Step 2: Multiply and subtract.

$$\begin{array}{r} 3 \\ 24\overline{)624} \\ \underline{72} \end{array}$$

Since 72 > 67, 3 is **too large**.

Step 3: Try a smaller number, multiply and subtract.

$$\begin{array}{r} 2 \\ 24\overline{)624} \\ \underline{48} \\ 14 \end{array}$$

Since 14 < 24, 2 is correct.

Step 4: Finish the problem.

Example B: $630 \div 15$

Step 1: Divide.

$$15\overline{)630}$$

15 rounds to 20. Think $2\overline{)6}$ is 3. So $15\overline{)63}$ is about 3.

Step 2: Multiply and subtract.

$$\begin{array}{r} 3 \\ 15\overline{)630} \\ \underline{45} \\ 18 \end{array}$$

Since 18 > 15, 3 is too small.

Step 3: Try a larger number, multiply and subtract.

$$\begin{array}{r} 4 \\ 15\overline{)630} \\ \underline{60} \\ 3 \end{array}$$

Since 3 < 15, 4 is correct.

Step 4: Finish the problem.

Exercise One

In each question, the **trial quotient** is either too large or too small. Multiply. Write too large or too small on the line. Then, write the correct trial quotient beside. Check your work using the answer key at the end of the exercise.

a) $25\overline{)475}$ $\begin{array}{r} 2 \\ \underline{50} \end{array}$ too large, 1

b) $15\overline{)682}$ 3 _____

c) $18\overline{)813}$ 5 _____

d) $25\overline{)810}$ 2 _____

e) $33\overline{)891}$ 3 _____

f) $18\overline{)819}$ 3 _____

g) $27\overline{)727}$ 3 _____

h) $35\overline{)652}$ 2 _____

i) $25\overline{)650}$ 3 _____

j) $34\overline{)176}$ 4 _____

k) $12\overline{)420}$ 4 _____

l) $43\overline{)801}$ 2 _____

m) $31\overline{)899}$ _____

n) $18\overline{)648}$ _____

o) $27\overline{)946}$ _____

p) $23\overline{)943}$ _____

q) $24\overline{)578}$ _____

r) $29\overline{)406}$ _____

s) $48\overline{)892}$ _____

t) $28\overline{)534}$ _____

u) $37\overline{)939}$ _____

v) $28\overline{)854}$ _____

w) $19\overline{)361}$ _____

x) $38\overline{)974}$ _____

Answers to Exercise One

a) too large, 1	b) too small, 4	c) too large, 4	d) too small, 3	e) too large, 2
f) too small, 4	g) too large, 2	h) too large, 1	i) too large, 2	j) too small, 5
k) too large, 3	l) too large, 1	m) too large, 2	n) too large, 3	o) too large, 3
p) too small, 4	q) too large, 2	r) too large, 1	s) too large, 1	t) too large, 1
u) too large, 2	v) too small, 3	w) too large, 1	x) too large, 2	

Exercise Two

In each question, the **trial quotient** is either too large or too small. Multiply. Write too large or too small on the line. Then, write the correct trial quotient beside. Check your work using the answer key at the end of the exercise.

a) $\begin{array}{r} 4 \\ 61\overline{)2\ 419} \\ \underline{2\ 44} \end{array}$ too large, 3

b) $\begin{array}{r} 3 \\ 42\overline{)1\ 253} \end{array}$ _____

c) $\begin{array}{r} 3 \\ 59\overline{)2\ 847} \end{array}$ _____

d) $\begin{array}{r} 9 \\ 32\overline{)2\ 752} \end{array}$ _____

e) $\begin{array}{r} 4 \\ 67\overline{)2\ 542} \end{array}$ _____

f) $\begin{array}{r} 3 \\ 71\overline{)2\ 914} \end{array}$ _____

g) $\begin{array}{r} 3 \\ 82\overline{)1\ 958} \end{array}$ _____

h) $\begin{array}{r} 3 \\ 18\overline{)7\ 250} \end{array}$ _____

i) $\begin{array}{r} 5 \\ 25\overline{)1\ 550} \end{array}$ _____

j) $\begin{array}{r} 5 \\ 19\overline{)9\ 395} \end{array}$ _____

k) $39\overline{)3\,854}$ _____

l) $24\overline{)9\,648}$ _____

m) $28\overline{)1\,176}$ _____

n) $23\overline{)1\,387}$ _____

o) $48\overline{)2\,973}$ _____

p) $48\overline{)2\,396}$ _____

q) $28\overline{)1\,665}$ _____

r) $23\overline{)1\,387}$ _____

s) $47\overline{)1\,928}$ _____

t) $79\overline{)2\,765}$ _____

u) $52\overline{)1\,968}$ _____

v) $72\overline{)2\,813}$ _____

w) $94\overline{)8\,126}$ _____

x) $59\overline{)4\,163}$ _____

Answers to Exercise Two

a) too large, 3	b) too large, 2	c) too small, 4	d) too large, 8	e) too large, 3
f) too small, 4	g) too large, 2	h) too small, 4	i) too small, 6	j) too large, 4
k) too small, 9	l) too large, 4	m) too small, 4	n) too large, 6	o) too small, 6
p) too large, 4	q) too large, 5	r) too large, 6	s) too small, 4	t) too large, 3
u) too large, 3	v) too large, 3	w) too large, 8	x) too small, 7	

Example A: $78\overline{)2\,706}$

Since 78 rounds to 80, think $8\overline{)27}$. 8 goes into $27 \approx 3$. 3 would be a good trial quotient.

$$\begin{array}{r} 3 \\ 78\overline{)2\ 706} \\ \underline{2\ 34} \\ 36 \end{array}$$

Since $36 < 78$, 3 is a good trial quotient.

Example B: $27\overline{)2205}$

Since 27 rounds to 30, think $3\overline{)22}$. 3 goes into $22 \approx 7$. 7 would be a good trial quotient.

$$\begin{array}{r} 3 \\ 27\overline{)2\ 205} \\ \underline{1\ 89} \\ 31 \end{array}$$

$31 > 27$, so 3 is too small. A better trial quotient would be 4.

Exercise Three

Find the first digit in the **trial quotient**. Check your work using the answer key at the end of the exercise.

a) $43\overline{)1\,772}$

b) $64\overline{)3\,276}$

c) $28\overline{)6\,008}$

$$\begin{array}{r} 4 \\ 4\overline{)17} \\ \underline{16} \\ 1 \end{array}$$

$1 < 4$

d) $33\overline{)2\,731}$

e) $59\overline{)4\,164}$

f) $75\overline{)2\,420}$

g) $54\overline{)3\,316}$

h) $38\overline{)2\,759}$

i) $46\overline{)3\,827}$

j) $35\overline{)1\,533}$

k) $83\overline{)7\,237}$

l) $77\overline{)6\,763}$

m) $93\overline{)3\,724}$

n) $52\overline{)4\,690}$

o) $86\overline{)2\,089}$

p) $26\overline{)1\ 417}$ q) $72\overline{)1\ 462}$ r) $27\overline{)6\ 939}$

s) $32\overline{)7\ 840}$ t) $24\overline{)7\ 605}$ u) $16\overline{)8\ 640}$

v) $45\overline{)3\ 060}$ w) $38\overline{)2\ 158}$ x) $42\overline{)1\ 491}$

Answers to Exercise Three

a) 4	b) 5	c) 2	d) 8	e) 7	f) 3	g) 6
h) 7	i) 8	j) 4	k) 8	l) 8	m) 4	n) 9
o) 2	p) 5	q) 2	r) 2	s) 2	t) 3	u) 5
v) 6	w) 5	x) 3				

Dividing by Two and Three Digit Divisors

Dividing by large divisors is a challenge!

You must **estimate** how many times one number will divide into another. Use pencil and have an eraser close by when you do these questions. You will use the same steps that you already know.

Example A: $964 \div 75 =$ _____

Step 1: Divide

- Does 75 go into 9? **NO**
- Does 75 go into 96? **YES**
- **Estimate**

  Round 75 to 80 – think "8"

  Round 96 to 100 – think "10"

  How many 8's in 10? ($8 \times 1 = 8$, $10 \div 8 = 1$)

  The estimate for the first digit in the trial quotient is 1.
- Write **1** in the quotient above the 6 tens.

$$75\overline{)964}\quad 1$$

Step 2: Multiply $1 \times 75 = 75$

Write 75 under 96.

$$\begin{array}{r} 1 \\ 75\overline{)964} \\ \underline{75} \end{array}$$

Step 3: Subtract $96 - 75 = 21$

Check $21 < 75$? ✓

$$\begin{array}{r} 1 \\ 75\overline{)964} \\ \underline{75} \\ 21 \end{array}$$

Step 4: **Bring down the next digit** in the dividend. 214 is now the number to be divided.

$$\begin{array}{r} 1 \\ 75\overline{)964} \\ \underline{75}\downarrow \\ 214 \end{array}$$

REPEAT

Step 1: **Divide**

- Does 75 go into 214? **YES**
- Estimate 75 as 80 – think "8"
  - Estimate 214 as 200 – think "20"
  - 8 goes into 20 $\approx$ 2 times ($8 \times 2 = 16$, so $20 \div 8 \approx 2$)
- The estimate for the second digit in the trial quotient is 2. Write 2 in the quotient above the 4 in the dividend.

$$\begin{array}{r} 12 \\ 75\overline{)964} \\ \underline{75}\downarrow \\ 214 \end{array}$$

Step 2: **Multiply** $2 \times 75 = 150$

Write 150 under the 214.

$$\begin{array}{r} 12 \\ 75\overline{)964} \\ \underline{75}\downarrow \\ 214 \\ \underline{150} \end{array}$$

Step 3: **Subtract and check** that the remainder is less than the divisor.

$$\begin{array}{r} 12 \\ 75\overline{)964} \\ \underline{75}\downarrow \\ 214 \\ \underline{150} \\ 64 \end{array}$$

Step 4: **Bring down** – no more digits in dividend.

To check your answer

$$\begin{array}{r} 75 \\ \times\ 12 \\ \hline 150 \\ \underline{750} \\ 900 \\ \underline{+\ 64} \quad \text{remainder} \\ 964 \end{array}$$

Example B: $2\,975 \div 42 =$ _____

Step 1: **Divide**

- Does 42 go into 2? **NO**
- Does 42 go into 29? **NO**
- Does 42 go into 297? **YES**

Estimate

Round 42 to 40 and think "4".
Round 297 to 300 and think "30".
4 goes into 30 $\approx$ 7 times ($4 \times 7 = 28$, so $30 \div 4 \approx 7$)
Your estimate is 7.

$$\begin{array}{r} 7 \\ 42\overline{)\,2\,975} \end{array}$$

Step 2: **Multiply** $7 \times 42 = 294$

$$\begin{array}{r} 7 \\ 42\overline{)\,2\,975} \\ \underline{2\,94} \end{array}$$

Step 3: **Subtract** $297 - 294 = 3$

Check $3 < 42$ ✓

$$\begin{array}{r} 7 \\ 42\overline{)\,2\,975} \\ \underline{2\,94} \\ 3 \end{array}$$

Step 4: **Bring down the next digit** in the dividend. 35 is now the number to be divided.

$$\begin{array}{r} 7 \\ 42\overline{)\,2\,975} \\ \underline{2\,94}\downarrow \\ 35 \end{array}$$

REPEAT

Step 1: **Divide**

- Does 42 go into 35? **NO**
- **Place a 0 in the quotient above the 5 ones in the dividend to hold the ones place.**

$$\begin{array}{r} 70 \\ 42\overline{)\,2\,975} \\ \underline{2\,94}\downarrow \\ 35 \end{array}$$

Step 2: **Multiply** $0 \times 42 = 0$

$$\begin{array}{r} 70 \\ 42\overline{)\,2\,975} \\ \underline{2\,94}\downarrow \\ 35 \\ \underline{0} \end{array}$$

Step 3: **Subtract** $35 - 0 = 35$

Check $35 < 42$ ✓

$$\begin{array}{r} 70 \\ 42\overline{)\,2\,975} \\ \underline{2\,94}\downarrow \\ 35 \\ \underline{0} \\ 35 \end{array}$$

Step 4: No other digits in the dividend to bring down.

$2\,975 \div 42 = 70$ R 35

Exercise Four

Carefully divide these questions. Be careful to keep the hundreds in line with the hundreds, the tens with the tens, and so on. You might want to use squared paper for long division. Check your work using the answer key at the end of the exercise.

If you are having **any** difficulty, ask your instructor to watch you doing a few questions to be sure you are using a correct method.

a) $10\overline{)720}$ b) $12\overline{)564}$ c) $21\overline{)882}$

d) $22\overline{)946}$ e) $32\overline{)1\,632}$ f) $23\overline{)943}$

g) $62\overline{)2\,528}$ h) $71\overline{)2\,414}$ i) $24\overline{)578}$

j) $82\overline{)2\,958}$ k) $18\overline{)6\,250}$ l) $25\overline{)1\,550}$

m) $19\overline{)9\ 595}$ n) $47\overline{)3\ 854}$ o) $58\overline{)6\ 500}$

p) $24\overline{)9\ 648}$ q) $49\overline{)1\ 312}$ r) $67\overline{)7\ 683}$

Answers to Exercise Four

a) 72	b) 47	c) 42	d) 43	e) 51
f) 41	g) 44	h) 34 R2	i) 24 R2	j) 36 R6
k) 347 R4	l) 62	m) 505	n) 82	o) 112 R4
p) 402	q) 26 R38	r) 114 R45		

If the estimate for your trial quotient is too large the result of the multiplication will be larger than the numbers in the dividend.

Divide Trial estimate is 4.

Multiply $4 \times 23 = 92$
92 is larger than 78, so 4 is too large an estimate. Erase it. Try 3. $3 \times 23 = 69$
3 is the correct estimate and you can complete the division.

$23\overline{)784}$ $\quad$ $\begin{array}{r} 4 \\ 23\overline{)784} \\ \underline{92} \end{array}$ $\quad$ $\begin{array}{r} 34 \text{ R } 2 \\ 23\overline{)784} \\ \underline{69}\downarrow \\ 94 \\ \underline{92} \\ 2 \end{array}$

If the estimate is too small, the result of the subtraction will be larger than the divisor.

Divide Trial estimate is 5.

Multiply $5 \times 72 = 360$

Subtract $448 - 360 = 88$
Check $88 < 72$? **NO**, 88 is greater than 72.
So 5 is too small. Erase it and use a larger number.
6 will be a better estimate.

Divide $448 \div 72 \approx 6$

Multiply $6 \times 72 = 432$

Subtract $448 - 432 = 16$ $\quad$ Check $16 < 72$ ✓

Bring down the next digit and complete the division.

$72\overline{)4\,487}$ $\quad$ $\begin{array}{r} 5 \\ 72\overline{)4\,487} \\ \underline{360} \end{array}$ $\quad$ $\begin{array}{r} 62 \text{ R } 23 \\ 72\overline{)4\,487} \\ \underline{4\,32}\downarrow \\ 1676 \\ \underline{1446} \\ 23 \end{array}$

Exercise Five

Divide and check your work by multiplying. Check your work using the answer key at the end of the exercise.

a) $31\overline{)899}$

b) $28\overline{)1\,176}$

c) $24\overline{)192}$

d) $23\overline{)1\,387}$

e) $48\overline{)2\,593}$

f) $19\overline{)1\,653}$

g) $13\overline{)169}$

h) $24\overline{)2\,496}$

i) $28\overline{)1\,765}$

j) $35\overline{)4\,165}$

k) $36\overline{)8\,647}$

l) $55\overline{)3\,462}$

m) $29\overline{)406}$

n) $62\overline{)3\,782}$

o) $26\overline{)3\,385}$

Answers to Exercise Five

a) 29	b) 42	c) 8	d) 60 R7	e) 54 R1
f) 87	g) 13	h) 104	i) 63 R1	j) 119
k) 240 R7	l) 62 R52	m) 14	n) 61	o) 130 R5

Exercise Six

Divide and check your work by multiplying. Check your work using the answer key at the end of the exercise.

a) $18\overline{)648}$ b) $26\overline{)6\ 766}$ c) $52\overline{)1\ 968}$

d) $84\overline{)8\ 640}$ e) $72\overline{)2\ 883}$ f) $94\overline{)8\ 126}$

g) $20\overline{)4\ 060}$ h) $47\overline{)1\ 728}$ i) $33\overline{)1\ 886}$

j) $25\overline{)5\ 750}$ k) $79\overline{)2\ 765}$ l) $42\overline{)8\ 442}$

m) $57\overline{)9\,144}$ n) $96\overline{)20\,160}$ o) $75\overline{)23\,550}$

Answers to Exercise Six

a) 36	b) 260 R6	c) 37 R44	d) 102 R72	e) 40 R3
f) 86 R 42	g) 203	h) 36 R36	i) 57 R5	j) 230
k) 35	l) 201	m) 106 R24	n) 210	o) 314

Dividing by 10, 100, 1 000 …

Exercise Seven

Find the quotients. Look for the pattern. Check your work using the answer key at the end of the exercise.

a) $10\overline{)46}$ b) $10\overline{)75}$ c) $10\overline{)136}$ d) $10\overline{)832}$

e) $10\overline{)674}$ f) $10\overline{)952}$ g) $10\overline{)2\ 457}$ h) $10\overline{)3\ 685}$

What is the pattern? When you divide by 10

- The ones digit in the dividend becomes the remainder.

  $10\overline{)324}$ = 32 R 4

- The other numbers in the dividend stay the same but each digit is one place value less.
  - the hundreds become tens
  - the tens become ones
  - the ones become the remainder

Answers to Exercise Seven

a) 4 R6 b) 7 R5 c) 13 R6 d) 83 R2 e) 67 R4
f) 95 R2 g) 245 R7 h) 368 R5

Exercise Eight

Find these quotients. Look for the pattern when you divide.
Check your work using the answer key at the end of the exercise.

a) $100\overline{)386}$ b) $100\overline{)995}$ c) $100\overline{)269}$ d) $100\overline{)175}$

e) $100\overline{)2\ 948}$ f) $100\overline{)4\ 671}$ g) $100\overline{)92\ 045}$ h) $100\overline{)43\ 821}$

When you divide by 100

- The ones and tens digits in the dividend become the remainder.
- The other digits in the dividend stay the same but each digit is **two** places less.
  - the thousands become tens
  - the hundreds become ones
  - the tens and ones become the remainder

Answers to Exercise Eight

a) 3 R86 b) 9 R95 c) 2 R69 d) 1 R75 e) 29 R48
f) 46 R71 g) 920 R45 h) 438 R21

Exercise Nine

Try these. Check your work using the answer key at the end of the exercise.

a) $1\,000\overline{)2\,398}$ b) $1\,000\overline{)6\,475}$ c) $1\,000\overline{)4\,835}$

d) $1\,000\overline{)63\,291}$ e) $1\,000\overline{)82\,405}$ f) $1\,000\overline{)293\,591}$

When you divide by 1 000

- The ones, tens, and hundreds digits become the remainder.
- The other digits stay the same but are **three** place values less.
  - thousands become ones
  - ten thousands become tens
  - hundred thousands become hundreds

Answers to Exercise Nine

a) 2 R398 b) 6 R475 c) 4 R835 d) 63 R291 e) 82 R405
f) 293 R591

Three Digit Divisors

If the divisor has three digits, use the method you know for two-digit divisors, but estimate the divisor to the nearest hundred to find the trial quotient. Be very **careful** to put the first digit in the quotient in the correct place.

Example: 17 902 ÷ 381 = _____

Step 1: Divide

- Does 381 go into 1? **NO**
- Does 381 go into 17? **NO**
- Does 381 go into 179? **NO**
- Does 318 go into 1 790? **YES**

Estimate 381 as 400 – think 4.

Estimate 1 790 as 1 800 – think 18.

4 goes into 18 ≈ 4 times (4 × 4 = 16)

Your estimate is 4. Write 4 in the quotient above the 0 in the dividend.

$$381\overline{)17\,902}\quad \text{quotient: } 4$$

Step 2: Multiply $4 \times 381 = 1\,524$

$$\begin{array}{r} 4 \\ 381\overline{)17\,902} \\ 15\,24 \end{array}$$

Step 3: Subtract $1\,790 - 1\,524 = 266$

Check $266 < 381$ ✓

$$\begin{array}{r} 4 \\ 381\overline{)17\,902} \\ 15\,24 \\ \hline 2\,66 \end{array}$$

Step 4: **Bring down** the 2. 2 662 is now the number to be divided.

$$\begin{array}{r} 4 \\ 381\overline{)17\ 902} \\ 15\ 24\downarrow \\ \hline 2\ 662 \end{array}$$

REPEAT

Step 1: **Divide** $2\ 662 \div 381 =$ _____

Estimate 318 as 400 – think of 4.

Estimate 2 662 as 2 700 – think 27.

4 goes into 27 $\approx$ 6 times ($4 \times 6 = 24$)

Place this estimate in the quotient above the 2.

$$\begin{array}{r} 46 \\ 381\overline{)17\ 902} \\ 15\ 24\downarrow \\ \hline 2\ 662 \end{array}$$

Step 2: **Multiply** $6 \times 381 = 2\ 286$

$$\begin{array}{r} 46 \\ 381\overline{)17\ 902} \\ 15\ 24\downarrow \\ \hline 2\ 662 \\ 2\ 286 \\ \hline \end{array}$$

Step 3: **Subtract** $2\ 662 - 2\ 286 = 376$

Check $376 < 381$ ✓

$$\begin{array}{r} 46 \\ 381\overline{)17\ 902} \\ 15\ 24\downarrow \\ \hline 2\ 662 \\ 2\ 286 \\ \hline 376 \end{array}$$

Step 4: No more digits to bring down.

$17\ 902 \div 381 = 46$ R 376

Exercise Ten

Divide and check your answers. These questions are hard work! Check your work using the answer key at the end of the exercise.

a) $115\overline{)8\ 682}$

b) $205\overline{)2\ 384}$

c) $325\overline{)66\ 321}$

d) $241\overline{)13\ 284}$

e) $860\overline{)262\ 412}$

f) $659\overline{)270\ 190}$

Answers to Exercise Ten

a) 75 R57 b) 11 R129 c) 204 R21 d) 55 R29 e) 305 R112
f) 410

Topic D: Self-Test

Mark /12 **Aim 10/12**

A. Divide and check your work for questions b and f using multiplication. 11 marks

a) $185 \div 10 =$

b) $408 \div 50 =$

c) $1\,824 \div 48 =$

d) $72\overline{)6\ 768}$

e) $67\overline{)5\ 963}$

f) $53\overline{)4\ 856}$

g) $91\overline{)8\ 736}$

h) $265\overline{)133\ 624}$

i) $606\overline{)26\ 094}$

j) $1000\overline{)83\ 652}$

Answers to Topic D Self-Test

A.

a) 18 R5	b) 8 R8	c) 38	d) 94	e) 89
f) 91 R33	g) 96	h) 504 R64	i) 43 R36	j) 83 R652

Topic E: Estimating Quotients

In Unit Three you learned a shortcut for multiplying numbers that end with zeros.
Now you will learn a short way to divide numbers that **both** end with zeros. First do this exercise and notice the pattern in the quotients.

Exercise One

Divide. Check your work using the answer key at the end of the exercise.

a) $2\overline{)6}$ b) $20\overline{)60}$ c) $200\overline{)600}$ d) $2\,000\overline{)6\,000}$

e) $5\overline{)25}$ f) $50\overline{)250}$ g) $500\overline{)2\,500}$ h) $5\,000\overline{)25\,000}$

i) $14\overline{)28}$ j) $140\overline{)280}$ k) $1\,400\overline{)2\,800}$ l) $14\,000\overline{)28\,000}$

Answers to Exercise One

a) 3 b) 3 c) 3 d) 3 e) 5 f) 5 g) 5
h) 5 i) 2 j) 2 k) 2 l) 2

Here is the shortcut:

When dividing numbers that both end with zeros, cross off the **same number** of **zeros** from the end of the divisor and the dividend. This is sometimes called **cancelling zeros.**

Example A: $4\,800 \div 60 = 4\,80\cancel{0} \div 6\cancel{0}$

$$6\overline{)480}\quad 80$$

Example B: $23\,000 \div 500 = 23\,0\cancel{0}\cancel{0} \div 5\cancel{0}\cancel{0}$

$$\begin{array}{r} 46 \\ 5\overline{)230} \\ \underline{20}\downarrow \\ 30 \\ \underline{30} \\ 0 \end{array}$$

Example C: $2\cancel{0}\cancel{0}\cancel{0}\overline{)680\cancel{0}\cancel{0}\cancel{0}}$

$$\begin{array}{r} 340 \\ 2\overline{)680} \\ \underline{6}\downarrow \\ 08 \\ \underline{8}\downarrow \\ 00 \\ \underline{0} \\ 0 \end{array}$$

If you are interested in the facts of arithmetic that make this shortcut work, ask your instructor for an explanation.

Exercise Two

Quickly find the quotients. Remember to cancel the **same number** of zeros in both the divisor and dividend in each question. Check your work using the answer key at the end of the exercise.

a) $30\overline{)90}$ b) $40\overline{)1\,600}$ c) $300\overline{)1\,200}$

d) $400\overline{)20\,000}$ e) $500\overline{)35\,000}$ f) $700\overline{)42\,000}$

g) $60\,000\overline{)2\,400\,000}$ h) $800\,000\overline{)400\,000\,000}$

Answers to Exercise Two

a) 3 b) 40 c) 4 d) 50 e) 70 f) 60 g) 40
h) 500

Rounding Division Questions to Estimate

We round numbers and estimate to get a quick answer.

In division, round the divisor and dividend **before** you divide.

- If the divisor only has one digit, do not round it,
- Round the dividend to make the arithmetic easier for yourself.

Example A: Look at the two ways of rounding this question.
1 796 ÷ 32 = _____

The divisor (32) will round to 30.
This dividend (1 796) can be rounded to 1 800 or to 2 000.

$$30\overline{)1\,800}\quad 60$$

$$30\overline{)2\,000}\quad 66\ \text{R}\ 2$$

18↓
20
18
2

Rounding 1 796 to 1 800 is easier arithmetic because 18 ÷ 3 works out evenly, so 180 ÷ 3 works out evenly. Both estimates are correct.

Example B: 2 688 ÷ 28 = _____

Round the divisor (28) to 30.
Round the dividend (2 688) to 2 700 or to 3 000.

$$30\overline{)2\,700}\quad 90$$

$$30\overline{)3\,000}\quad 100$$

Both estimates are correct and both are easy to do.

Example C: 2 893 ÷ 47 = _____

Round the divisor (47) to 50.
Round the dividend (2 893) to 2 900 or 3 000.
Which rounded dividend will be easier to divide by 50?

The 3 000 because 5 goes evenly into 30.

$$50\overline{)2\,000}\quad 60$$

Exercise Three

Give an estimated quotient. Show your rounding. Check your work using the answer key at the end of the exercise.

a) $365\overline{)27\ 692}$

b) $23\overline{)34\ 559}$

c) $45\overline{)4\ 590}$

d) $16\overline{)6\ 729}$

e) $56\overline{)4\ 792}$

f) $75\overline{)7\ 648}$

g) $81\overline{)4\,049}$

h) $68\overline{)5\,636}$

i) $19\overline{)1\,672}$

j) $218\overline{)22\,998}$

k) $557\overline{)41\,680}$

Answers to Exercise Three

a) $28\,000 \div 400 = 70$
b) $34\,000 \div 20 = 170$
c) $5\,000 \div 50 = 100$
d) $7\,000 \div 20 = 350$
e) $4\,800 \div 60 = 80$
f) $8\,000 \div 80 = 100$
g) $4\,000 \div 80 = 50$
h) $5\,600 \div 70 = 80$
i) $2\,000 \div 20 = 10$
j) $20\,000 \div 200 = 100$
k) $42\,000 \div 600 = 70$

Topic E: Self-Test

Mark /6 Aim 5/6

A. Give an estimated quotient. Show your work. 6 marks

a) $98\overline{)8\,541}$

b) $27\overline{)2\,963}$

c) $241\overline{)26\,348}$

d) $55\overline{)3\,276}$

e) $24\overline{)1\,776}$

f) $59\overline{)11\,830}$

Answers to Topic D Self-Test

A.

a) $8\,500 \div 100 = 85$ b) $3\,000 \div 30 = 100$ c) $26\,000 \div 200 = 130$

d) $3\,000 \div 60 = 50$ e) $2\,000 \div 20 = 100$ f) $12\,000 \div 60 = 200$

Topic F: Division Problems

Review the **Problem Solving Steps** in Book Two, Topic F.

One common type of division problem gives a total amount for **several** things and asks you to **find** what the amount would be for **one**.

Problems may tell you…	**and ask you to find…**
kilometres driven in 8 hours (h)	km driven in 1 h
cost for 15 kg (or litres, etc.)	cost for one kg
pay for 40 hours	pay for one hour
rent for one year (12 months)	rent for one month
work done in eight hours	work done in one hour
kilometres driven on 55 L of gas	km driven on 1 L of gas

The word *per* is a Latin word meaning "for each". For example, "Find the kilometres *per* hour" may be used to mean, "Find the kilometres driven in one hour." A slash (/) also means per e.g. km/h.

"Find the average" is another way of asking you to find the amount for one.

It may be difficult to decide which number is the dividend and which is the divisor. These suggestions should help:

- Look at the question in the problem. What do you have to find out? Look for the words "per" and "for one."

- How will the answer be written? That is your clue. If the answer is km/h then the division equation will be total km ÷ h. Study these examples:

  - total of kilometres ÷ number of hours = km/h
  - total of kilometres ÷ number of litres = km/L
  - total cost ÷ unit = cost per unit
  - total pay ÷ hours (or days, etc.) = pay per hour
  - total rent ÷ number of months = rent/month
  - total things done ÷ total time = number done/unit of time

- Do a quick estimate.

- Look at your estimate and re-read the problem. Does your answer make sense?

To **find the average**, divide the total amount by the number of items that make up the total. You may first have to add the different items together to find the total.

Average = Total amount ÷ number of items that make the total

Example A: You bowled 5 games with scores of 124, 187, 164, 205, 130. What was your average score?

Find the total by adding 124 + 187 + 164 + 205 + 130 = 810

Divide the total by number of items 810 ÷ 5 games = 162 per game

Example B: Joan and Rick have been keeping track of their household costs. They want to plan a monthly budget. Their grocery bills for six months were $428, $605, $397, $530, $590, and $474. What is their average monthly grocery cost?

Find the total amount.
$428 + $605 + $397 + $530 + $590 + $474 = $3 024

Divide total amount by number of items.
$3024 ÷ 6 = $504 average cost per month

Some Details to Remember

1 minute = 60 seconds

1 hour = 60 minutes

1 year = 365 days

1 year = 12 months

1 year = 52 weeks

Key Words That Point to DIVISION

Find the average	separated
Find the _____ per _____ .	split
Find the unit price	shared

Exercise One

Solve these problems. Use the five problem solving steps. Be sure to write down an estimate and check that the estimate makes sense **before** you find the actual solution. Check your work using the answer key at the end of the exercise.

a) A machine shop can stamp out 360 car parts in an 8 hour working day. How many parts is that per hour?

b) Izyan paid $560 for 4 tires. How much did each tire cost?

c) Bjork earned $8 840 in 4 months.

i) How much did he earn each month?

ii) How much did he earn per week? (4 months is 17 weeks)

d) Theron used 9 L of gasoline to drive 207 km. How many kilometres did he drive per litre?

e) The total cost of the car Elena bought is $14 880 including taxes and interest. She will pay for it in 24 equal payments. How much will each payment be?

f) Diego worked 8 hours a day for five days and earned $360. How much was he paid per hour? (This is a 2 step problem – you must first find the total number of hours.)

g) Dae-Hyun and Mi-Ok can afford no more than a total of $14 940 per year for rent, electricity, and phone. How much can they pay per month?

h) In four hours, Kamden cycled 64 km. What is his average speed in kilometers per hour?

i) Akbar drove 4 697 km on his 7 day trip across six provinces. What was the average number of kilometres that he drove each day?

j) The Scouts and Cubs collected 4 980 aluminum pop and beer cans on their fund raising "Bottle Drive". They squashed the cans and packed them into 20 boxes. What is the average number of cans per box?

Answers to Exercise One

a) 45 parts per hour b) $140 per tire c) i) $2 210 per month, ii) $520 per week
d) 23 km/L e) $620 per payment f) $9 per hour g) $1 245 per month
h) 16 km/hr i) 671 km/day j) 249 cans per box

A second type of division problem gives the total amount and the size of each group. You will find the number of groups. You will notice that **both numbers have the same units.** The **answer** to the problem **will give another unit.** This other unit will be asked for in the problem.

Example A: One necklace uses **125 beads**. How many necklaces can Susan make for the craft fair if she has **6 250 beads?**

Find how many groups of 125 there are in 6 520.

$6\,250 \div 125 =$ _____

$$\begin{array}{r} 50 \\ 125\overline{)\,6\,250} \\ \underline{6\,25} \\ 0 \end{array}$$

She can make **50 necklaces.**

Example B: If you drive an average speed of 80 km an hour, how many hours will it take you to drive 560 km?

Find how many groups of 80 km there are in 560 km.

$560 \div 80 = 7$

The 560 km trip will take 7 hours.

Exercise Two

Pay attention to wording and situations as you solve these problems. Use the five problem solving steps. Be sure to write down an estimate and check that the estimate makes sense **before** you find the actual solution. Check your work using the answer key at the end of the exercise.

a) A train travels 90 km per hour. How many hours will it take the train to go 540 km?

b) A car gets 16 km per litre of gasoline. How many litres will the car need to go 128 km?

c) About 8 m is needed for one parking space. How many parking spaces can be made along a street that is 232 m long?

d) If you spend an average of 8 minutes on one math problem, how many problems can you finish in one hour? Will you have any time left? How much?

e) The Skating Club members decided to sell home-made candy to raise money. The boxes they bought will hold 45 pieces of candy. If everyone makes a double batch of fudge they will have 2590 pieces of fudge. How many boxes can they fill? How many pieces of fudge are left-over for them to eat?

f) A class of 334 students is going to Victoria by bus. Each bus holds 43 passengers. How many buses do they need? Will there be any empty seats? (Be careful with this one!)

g) Steve Nash scores an average of 17 points per game. During the 2009-10 season, he scored 1 377 point in all. How many games did he play last season?

Answers to Exercise Two

a) 6 hours
b) 8 L
c) 29 parking spaces
d) 7 problems, yes, 4 min
e) 57 boxes, 25 pieces left over
f) 8 buses, 10 empty seats
g) 81 games

Unit Pricing

A unit price is the price on one of something. To find unit price, divide the total cost by the number of things bought.

Example A: 5 shirts cost $60

To find the cost per shirt, $60 ÷ 5 =

$$5\overline{)60}\quad 12$$

The unit price is $12.

Example B: 6 L of oil for $18

To find the cost per L, $18 ÷ 6 =

$$6\overline{)18}\quad 3$$

The unit price is $3.

Exercise One

Solve the cost per unit price. Check your work using the answer key at the end of the exercise.

a) 2 CDs for $26

b) 3 cans of dog food for $6

c) 4 air fresheners for $8

d) 2 cat treats for $4

e) 2 pizzas for $22

f) 2 cans of peanuts for $8

g) 2 ice cream for $12

h) 4 boxes of chocolate bars for $48

i) 2 WD-40 for $6

j) 3 paint rollers for $9

k) 4 tie downs for $20

l) 3 boxes of diapers for $51

m) 3 work shirts for $45

n) 8 pairs of socks for $64

Answers to Exercise One

a) $13	b) $2	c) $2	d) $2	e) $11	f) $4	g) $6
h) $12	i) $3	j) $3	k) $5	l) $17	m) $15	n) $8

Best Buy

The **best** buy is the **lowest unit price.**

Example A: 4 L of canola oil for $8 or 10 L of canola oil for $30

$8 ÷ 4 =

$$4\overline{)8}\quad 2$$

$30 ÷ 10 =

$$10\overline{)30}\quad 3$$

4L of canola oil for $8 is a better buy since the unit price is $2 per L, while 10 L for $30 has a unit price of $3 per L.

Exercise Two

Solve the unit price and then underline the best buy. Check your work using the answer key at the end of the exercise.

a) 2 L of engine oil for $8
5 L of engine oil for $15

b) 4 tires for $240
2 tires for $110

c) salad dressing for $24
3 salad dressing for $15

d) 7 kg of dog food for $21
16 kg of dog food for $32

e) 3 DVDs for $54
7 DVDs for $119

f) 3 L of laundry soap for $6
17 L of laundry soap for $68

Answers to Exercise Two

a) $4, $3, 5 L for $15 b) $60, $55, 2 tires for $110 c) $4, $5, 6 salad dressing for $24

d) $3, $2, 16 kg for $32 e) $18, $17, 7 DVDs for $119 f) $2, $4, 3 L for $6

Topic F: Self-Test

Mark /12 **Aim 10/12**

A. Solve these problems. **12 marks**
2 marks each – 1 for correct method, 1 for correct solution.

a) Enrique drove the 1 920 km from Dease Lake to Creston in 24 hours. What was his average speed in kilometres per hour?

b) The Evergreen Company employs 26 people. Its total payroll for last month was $84 162. What was the average monthly pay cheque per person?

c) The proud gardener grew a total crop of 135 cucumbers on 15 plants. What was the average crop per plant?

d) In a recent truckload sale, electric stoves were sold for $432. The gross income from the stove sale was $42 336. How many stoves were sold?

e) The 39 farmers in Jones Valley had a total income last year of $2 905 500. What was their average income?

f) A store has an inventory (stock on hand) of chairs with a total value of $1 738. Each chair is to be sold at $79. How many of these chairs are there?

Answers to Topic F Self-Test

A.

a) 80 km/h	b) $3 237 per month	c) 9 cucumbers per plant
d) 98 stoves	e) $74, 500	f) 22 chairs

Topic G: Mixed Problems

Carefully read again the **Problem Solving Steps** in Book Two, Topic F or ask your instructor for a copy of those pages. Read the problems to help you *get a feel* for the wording and problem situations you can expect for addition, subtraction, multiplication, and division problems. Ask your instructor for a list of key words that will point to the operation you should choose.

Exercise One

Solve these problems using the five problem solving steps. Show your estimation and actual work. Write a sentence answer remembering to use the **units**. Check your work using the answer key at the end of the exercise.

a) Saika gave her students cinnamon hearts on Valentine's Day. She bought a box of 1 120 cinnamon hearts and gave each student 35 candies, using up the whole box. How many students does she have?

b) Each stamp cost 57 cents. Dolores bought 100 stamps. How much money did she spend on stamps (before taxes)?

c) Etienne planted 30 tomato plants in rows of 5 plants. How many rows did he plant?

d) There are 8 servings per large economy-size can of fruit. The restaurant ordered 5 cases with 24 cans per case. How many servings of fruit can the restaurant get from this order? (This is a two step problem – first find the total number of cans. Then find the number of servings.)

e) A train traveled 2 250 km at a speed of 75 km per hour. How many hours did the trip take?

f) The regular mountain bike costs $499 and the fancy model is $675. How much more do you pay for the fancy mountain bike?

g) The members of the Shiny Wheels Bicycle Club ride at an average speed of 16 km/h. On their weekend trip they rode 2 hours Friday night, 7 hours on Saturday, spent two hours soaking their aching bones at the Hot Springs, and then rode a final five hours on Sunday. How many kilometres did they ride on this weekend trip? (2 steps)

h) Last week Mrs. Sanderson drove 29 km on Monday, 42 km on Tuesday, 5 km on Wednesday, and 21 km on Friday. How far did she drive last week?

i) The Yeung family has an income of $4 232 per month. Their rent is $1 157. 00. How much do they have left after paying the rent?

j) Last year, Mr. Yee drove his car 87 240 km. What was his monthly average?

k) Davinder lives 6 blocks from school. She walks back and forth to school and also walks when she comes home for lunch every day.

i) How many blocks does Davinder walk on her trips to and from school in one day?

ii) How many blocks does she walk to and from school in one school week (5 days)?

l) The Bolshevik Revolution in 1917 saw the beginning of the Union of Soviet Socialist Republics (USSR). In 1991, the USSR crumbled and many of the republics broke away. How many years are there between the Bolshevik Revolution and the end of the USSR?

m) A plane travels 4 785 km in 11 hours. What is its average speed per hour?

n) The Marchettis are saving to buy cross-country skis for the family. The ski equipment will cost $1 275 altogether. Mrs. Marchetti has been saving $75 each month. At that rate of saving, how many months will it take before she can buy the skis?

o) A new play, which was 95 minutes long, was performed for 4 nights. A total of 3 368 people bought tickets to see it. What was the average nightly attendance?

p) The continent of North America is the home of three countries – Canada, the United States of America, and Mexico. The area of Canada is 9 984 670 square kilometres. The area of the USA is 9 629 091 square kilometres and the area of Mexico is 1 964 375 square kilometres. According to these figures, what is the total area of these three countries?

Answers to Exercise One

a) 32 students	b) $57.00	c) 6 rows
d) 960 servings	e) 30 hours	f) $176 more
g) 224 km	h) 97 km	i) $3 075
j) 7 270 km per month	k) i) 24 blocks, ii) 120 blocks	l) 74 years
m) 435 km/h	n) 17 months	o) 842 people
p) 21 578 136 square kilometres		

Unit 3 Review - Division

You will now practice all the skills you learned in Unit 3. Check your work using the answer key at the end of the review.

A. Complete this chart.

	Multiplication	**Division**	**Division**	**"Say"**
a)	$5 \times 3 = 15$ $3 \times 5 = 15$	$15 \div 3 = 5$ $15 \div 5 = 3$	$3\overline{)15}$ (5) $5\overline{)15}$ (3)	*15 divided by 3 is 5.* *15 divided by 5 is 3.*
b)	$3 \times 6 = 18$			
c)	$3 \times 7 = 21$			
d)	$5 \times 9 = 45$			

B. Give the answer.

a) $56 \div 7 =$ b) $40 \div 8 =$ c) $54 \div 9 =$

d) $6\overline{)42}$ e) $9\overline{)72}$ f) $8\overline{)32}$

C. Find the quotients.

a) $7\overline{)68}$

b) $4\overline{)29}$

c) $5\overline{)24}$

d) $6\overline{)53}$

D. Put a check mark for each number that divides evenly.

	Number	2	3	5	9
a	135				
b	384				
c	4 614				
d	495				
e	648				
f	745				

E. Find the quotients.

a) $8\overline{)296}$

b) $6\overline{)252}$

c) $4\overline{)732}$ d) $5\overline{)175}$

F. Find the quotients.

a) $3\overline{)86}$ b) $4\overline{)97}$

c) $2\overline{)71}$ d) $5\overline{)59}$

G. Find the quotients.

a) $7\overline{)615}$ b) $2\overline{)647}$

c) $3\overline{)781}$ d) $9\overline{)839}$

H. Find the quotients.

a) $8\,956 \div 42 =$

b) $32\overline{)832}$

c) $69\,140 \div 56 =$

d) $312\overline{)9\,984}$

e) $41\,082 \div 334 =$

f) $781\overline{)39\,752}$

g) $275\overline{)55\,661}$

h) $307\overline{)91\,838}$

I. Find the quotients.

a) $1\,000\overline{)38\,645}$

b) $18\,592 \div 100 =$

c) $4\,923 \div 10 =$

d) $100\overline{)17\,342}$

J. Quickly find the quotients. Remember to cancel the <u>same number</u> of zeros in both the divisor and dividend in each question.

a) $200\overline{)50\,000}$

b) $6\,000\overline{)360\,000}$

c) $40\,000\overline{)1\,600\,000}$

d) $70\,000\overline{)6\,300\,000}$

K. Give an estimated quotient. Show your rounding.

a) $37\overline{)15\ 725}$

b) $54\overline{)8\ 478}$

c) $768\overline{)63\ 721}$

d) $6\ 267\overline{)536\ 497}$

L. Word Problems.

a) At the Kaizen Factory, 14 325 cars were put together in 5 days. Each day the same number of cars were built. How many cars were built each day?

b) The Blaster Rubber Company needs to make 6 912 hockey pucks. Mr. Frost, the foreman, says that their machines can make the pucks in 12 hours. How many pucks would be made in one hour?

c) The distance between Fort St. John and Kimberley is 1 092 km. What was your average speed if the trip took 12 hours?

d) The new stadium has 15 981 seats divided evenly into 76 sections. Estimate how many seats are in each section?

M. Solve the cost per unit price.

a) 4 rolls of hockey tape for $8

b) 4 cans of butane fuel for $12

N. Solve the unit price and then underline the best buy.

a) 2 L of antifreeze for $6
5 L of antifreeze for $10

b) 8 kilograms of bird seed for $16
4 kilograms of bird seed for $12

O. Word Problems.

a) The bakery uses 43 kilograms of butter in each batch of shortbread cookies. How many batches of shortbread can be make from 3 569 kilograms of butter?

b) Each crate that the men unloaded weighed 175 kilograms. If they unloaded 232 crates, how many kilograms did they unload?

c) The parts factory produced 4 173 less parts this month than last month. The factory produced 49 736 parts this month. How many parts did the factory produce last month?

d) Three Eastjet jets were flown 24 826 kilometres, 9 423 kilometres and 56 015 kilometres. What is the total kilometres the three jets were flown?

Answers to Unit 3 Review

A.

	Multiplication	Division	Division	"Say"
a)	$5 \times 3 = 15$ $3 \times 5 = 15$	$15 \div 3 = 5$ $15 \div 5 = 3$	$3\overline{)15}\ 5$ $5\overline{)15}\ 3$	*15 divided by 3 is 5* *15 divided by 5 is 3*
b)	$3 \times 6 = 18$ $6 \times 3 = 18$	$18 \div 6 = 3$ $18 \div 3 = 6$	$6\overline{)18}\ 3$ $3\overline{)18}\ 6$	*18 divided by 3 is 6.* *18 divided by 6 is 3.*
c)	$3 \times 7 = 21$ $7 \times 3 = 21$	$21 \div 7 = 3$ $21 \div 3 = 7$	$7\overline{)21}\ 3$ $3\overline{)21}\ 7$	*21 divided by 7 is 3.* *21 divided by 3 is 7.*
d)	$5 \times 9 = 45$ $9 \times 5 = 45$	$45 \div 9 = 5$ $45 \div 5 = 9$	$9\overline{)45}\ 5$ $5\overline{)45}\ 9$	*45 divided by 9 is 5.* *45 divided by 5 is 9.*

B.

a) 8 b) 5 c) 6 d) 7 e) 8 f) 4

C.

a) 9 R5 b) 7 R1 c) 4 R4 d) 8 R5

D.

	Number	2	3	5	9
a	135		√	√	√
b	384	√	√		
c	4 614	√	√		
d	495		√	√	√
e	648	√	√		√
f	745			√	

E.

a) 37 b) 42 c) 183 d) 35

F.

a) 28 R2 b) 24 R1 c) 35 R1 d) 11 R4

G.

a) 87 R6 b) 323 R1 c) 260 R1 d) 93 R2

H.

a) 213 R10 b) 26 c) 1 234 R36 d) 32

e) 123 f) 50 R702 g) 202 R111 h) 299 R45

I.

a) 38 R645 b) 185 R92 c) 492 R3 d) 173 R42

e) 38 R645 f) 185 R92

J.

a) 250 b) 60 c) 40 d) 90

K.

a) $16\,000 \div 40 = 400$ b) $8\,500 \div 50 = 170$

c) $64\,000 \div 800 = 80$ d) $540\,000 \div 6\,000 = 90$

L.

a) 2 865 cars/day b) 576 pucks/h

c) 91 hours d) $16\,000 \div 80 = 200$ seats/section

M.

a) \$2 b) \$3

N.

a) \$3, \$2, 5 L of antifreeze for \$10 b) \$2, \$3, 8 kilograms of bird seed for \$16

O.

a) 83 batches b) 40 600 kilograms c) 53 909 parts d) 90 264 kilometres

CONGRATULATIONS!!

Now you have finished Unit 3.

TEST TIME!

Ask your instructor for the Practice Test for this unit.
Once you've done the practice test,
you need to do the unit 3 test.
Again, ask your instructor for this.
Good luck!

Unit Four

Change, Time & The Metric System

Topic A: Counting to Make Change

Practice your counting by filling in the counting chart. Have your instructor check your chart when you are done.

0	1	2	3	4	5	6	7	8	9
10									

Use your counting chart and start at 0. Count two and write down that number.

0	**2**	**4**							

If you had a pile of twonies or two dollar coins and wanted to know how much money you have, you would count by 2's.

Use your counting chart and start at 0. Count five and write down that number.

0	**5**	**10**							

If you had a pile of nickels or five dollar bills and wanted to know how much money you have, you would count by 5's.

Use your counting chart and starting at 0. Count ten and write down that number.

0	**10**	**20**							

If you had a pile of dimes or ten dollar bills and wanted to know how much money you have, you would count by 10's.

Use your counting chart and start at 0. Count twenty and write down that number.

0	**20**	**40**			

If you had a pile of twenty dollar bills and wanted to know how much money you have, you would count by 20's.

Use your counting chart and start at 0. Count twenty-five and write down that number.

0	**25**			

If you had a pile of quarters and wanted to know how much money you have, you would count by 25's.

Exercise One

Write the missing numerals. Check your work using the answer key at the end of the exercise.

a) Count by 5's.

0		**10**		**20**		**30**		**40**	
50		**60**		**70**		**80**		**90**	

b) Count by 5's.

0	**5**		**15**		**25**		**35**		**45**
	55		**65**		**75**		**85**		**95**

c) Count by 5's.

0									

d) Count by 10's.

0	**10**		**30**		**50**		**70**		**90**

e) Count by 10's.

0		**20**		**40**		**60**		**80**	
100									

f) Count by 10's.

0									

g) Count by 20's

0		**40**		**80**	

h) Count by 20's

0					

i) Count by 25's.

0	**25**		**75**	

j) Count by 25's.

0		**50**		**100**

k) Count by 25's.

0				

Answers to Exercise One

a) Count by 5's

0	***5***	**10**	***15***	**20**	***25***	**30**	***35***	**40**	***45***
50	***55***	**60**	***65***	**70**	***75***	**80**	***85***	**90**	***95***
100									

b) Count by 5's

0	**5**	***10***	**15**	***20***	**25**	***30***	**35**	***40***	**45**
50	**55**	***60***	**65**	***70***	**75**	***80***	**85**	***90***	**95**
100									

c) Count by 5's

0	***5***	***10***	***15***	***20***	***25***	***30***	***35***	***40***	***45***
50	***55***	***60***	***65***	***70***	***75***	***80***	***85***	***90***	***95***
100									

d) Count by 10's

0	**10**	***20***	**30**	***40***	**50**	***60***	**70**	***80***	**90**
100									

e) Count by 10's

0	***10***	**20**	***30***	**40**	***50***	**60**	***70***	**80**	***90***
100									

f) Count by 10's

0	***10***	***20***	***30***	***40***	***50***	***60***	***70***	***80***	***90***
100									

g) Count by 20's

0	***20***	**40**	***60***	**80**	***100***

h) Count by 20's

0	***20***	***40***	***60***	***80***	***100***

i) Count by 25's

0	**25**	***50***	**75**	***100***

j) Count by 25's

0	***25***	**50**	***75***	**100**

k) Count by 25's

0	***25***	***50***	***75***	***100***

Note: There is no self-test for this topic.

Topic B: Making Change

When you make change, your first goal is to get a number that ends in 0 or 5. So for example, if you bought something for $4, the first thing to do would be to get to $5. Check out example A below.

Example A: $4 to $5

To get from $4 to $5, you would need 1 loonie.

Example B: $23 to $25

To get from 20¢ to 25¢, you would 1 twonie.

Example C: $55 to $60

To get from $55 to $60, you would need 1 five dollar bill.

Exercise One

Circle the number of coins or bills you would need to get from the first number to the second number. Make sure to use the least number of coins or bills. Check your work using the answer key at the end of the exercise.

a) $33 to $35

b) $48 to $50

c) $16 to $20

d) $68 to $70

e) $10 to $15

f) $35 to $40

g) $55 to $60

h) $85 to $90

i) $60 to $70

j) $90 to $100

k) $30 to $40

l) $40 to $50

m) $30 to $50




n) $70 to $80




o) $80 to $100




p) $45 to $50

q) $21 to $25

r) $55 to $60

s) $45 to $50

t) $40 to $50

u) $70 to $80

Answers to Exercise One

a)	1 twonie	b)	1 twonie	c)	2 twonies	d)	1 twonie	e)	1 - $5	f)	1 - $5	g)	1 - $5
h)	1 - $5	i)	1 - $10	j)	1 - $10	k)	1 - $10	l)	1 - $10	m)	1 - $20	n)	1 - $10
o)	1 - $20	p)	1 - $5	q)	2 twonies	r)	1 - $5	s)	1 - $5	t)	1 - $10	u)	1 - $10

Exercise Two

State the number and kind of coins and bills you would need to get from the first number to the second number. Make sure you use the least number of coins and bills as possible. Check your work using the answer key at the end of the exercise.

Example: **$56 to $60**
2 twonies to get to $60.

a) $28 to $30

b) $35 to $40

c) $90 to $100

d) $30 to $50

e) $54 to $55

f) $30 to $50

g) $65 to $70

h) $45 to $50

i) $80 to $100

j) $41 to $45

k) $6 to $10

l) $55 to $60

m) $15 to $20

n) $55 to $60

o) $88 to $90

p) $23 to $25

q) $86 to $90

r) $80 to $100

s) $98 to $100

t) $75 to $80

u) $46 to $50

Answers to Exercise Two

a)	1 twonie	b)	1 - $5	c)	1 - $10	d)	1 - $20	e)	1 loonie	f)	1 - $20	g)	1 - $5
h)	1 - $5	i)	1 - $20	j)	2 twonies	k)	2 twonies	l)	1 - $5	m)	1 - $5	n)	1 - $5
o)	1 twonie	p)	1 twonie	q)	2 twonies	r)	1 - $20	s)	1 twonie	t)	1 - $5	u)	2 twonies	

Example A: **$28 to $50**

Need	To get to
1 twonie	$30
1 - $20 bill	$50

Example B: **$36 to $50**

Need	To get to
2 twonies	$40
1 - $10 bill	$50

Example C: **$63 to $80**

Need	To get to
1 twonie	$65
1 - $5 bill	$70
1 - $10 bill	$80

Exercise Three

State the number and kind of coins and bills you would need to get from the first number to the second number. Make sure you use the least number of coins and bills as possible. Check your work using the answer key at the end of the exercise.

Example: $67 to $70

Need	To get to
1 loonie	$68
1 twonie	$70
1 - $5 bill	$80

a) $26 to $40

Need	To get to

b) $47 to $60

Need	To get to

c) $69 to $80

Need	To get to

d) $18 to $20

Need	To get to

e) $34 to $50

Need	To get to

h) $82 to $100

Need	To get to

f) $51 to $60

Need	To get to

i) $93 to $100

Need	To get to

g) $78 to $100

Need	To get to

j) $3 to $10

Need	To get to

k) $61 to $80

Need	To get to

n) $64 to $80

Need	To get to

l) $58 to $100

Need	To get to

o) $9 to $20

Need	To get to

m) $22 to $40

Need	To get to

p) $72 to $100

Need	To get to

q) $43 to $60

Need	To get to

t) $86 to $100

Need	To get to

r) $84 to $100

Need	To get to

u) $11 to $20

Need	To get to

s) $37 to $50

Need	To get to

v) $73 to $100

Need	To get to

Answers to Exercise Three

a) $26 to $40

Need	To get to
2 twonies	*$30*
1 - $10	*$40*

b) $47 to $60

Need	To get to
1 loonie	*$48*
1 twonie	*$50*
1 - $10	*$60*

c) $69 to $80

Need	To get to
1 loonie	*$70*
1 - $10	*$80*

d) $18 to $20

Need	To get to
2 twonies	*$20*

e) $34 to $50

Need	To get to
1 loonie	*$35*
1 - $5	*$40*
1 - $10	*$50*

f) $51 to $60

Need	To get to
2 twonies	*$55*
1 - $5	*$60*

g) $78 to $100

Need	To get to
2 twonies	*$80*
1 - $20	*$100*

h) $82 to $100

Need	To get to
1 loonie	*$83*
1 twonie	*$85*
1 - $5	*$90*
1 - $10	*$100*

i) $93 to $100

Need	To get to
1 twonie	*$95*
1 - $5	*$100*

j) $3 to $10

Need	To get to
1 twonie	*$5*
1 - $5	*$10*

k) $61 to $80

Need	To get to
2 twonies	*$65*
1 - $5	*$70*
1 - $10	*$80*

l) $58 to $100

Need	To get to
1 twonie	*$60*
2 - $20	*$100*

m) $22 to $40

Need	To get to
1 loonie	*$23*
1 twonie	*$25*
1 - $5	*$30*
1 - $10	*$40*

n) $64 to $80

Need	To get to
1 loonie	*$65*
1 - $5	*$70*
1 - $10	*$80*

o) $9 to $20

Need	To get to
1 loonie	*$10*
1 - $10	*$20*

p) $72 to $100

Need	To get to
1 loonie	*$73*
1 twonie	*$75*
1 - $5	*$80*
1 - $20	*$100*

q) $43 to $60

Need	To get to
1 twonie	*$45*
1 - $5	*$50*
1 - $10	*$60*

r) $84 to $100

Need	To get to
1 loonie	*$85*
1 - $5	*$90*
1 - $10	*$100*

s) $37 to $50

Need	To get to
1 loonie	*$38*
1 twonie	*$40*
1 - $10	*$50*

t) $86 to $100

Need	To get to
2 twonies	*$90*
1 - $10	*$100*

u) $11 to $20

Need	To get to
2 twonies	*$15*
1 - $5	*$20*

v) $73 to $100

Need	To get to
1 twonie	*$75*
1 - $5	*$80*
1 - $20	*$100*

Exercise Four

State the number and kind of coins and bills you would need to get from the first number to the second number. Make sure you use the least number of coins and bills as possible. Check your work using the answer key at the end of the exercise.

Example: **$67 to $80**

Need	To get to
1 loonie	$68
1 twonie	$70
1 - $10 bill	$80

a) $33 to $50

Need	To get to

b) $6 to $20

Need	To get to

c) $76 to $100

Need	To get to

f) $17 to $50

Need	To get to

d) $53 to $60

Need	To get to

g) $92 to $100

Need	To get to

e) $62 to $80

Need	To get to

h) $26 to $50

Need	To get to

i) $46 to $60

Need	To get to

l) $4 to $20

Need	To get to

j) $73 to $80

Need	To get to

m) $37 to $50

Need	To get to

k) $83 to $100

Need	To get to

n) $98 to $100

Need	To get to

o) $63 to $80

Need	To get to

r) $23 to $50

Need	To get to

p) $42 to $50

Need	To get to

s) $56 to $100

Need	To get to

q) $19 to $50

Need	To get to

t) $31 to $50

Need	To get to

u) $89 to $100

Need	To get to

v) $32 to $50

Need	To get to

Answers to Exercise Four

a) $33 to $50

Need	To get to
1 twonie	*$35*
1 - $5	*$40*
1 - $10	*$50*

b) $6 to $20

Need	To get to
2 twonies	*$10*
1 - $10	*$20*

c) $76 to $100

Need	To get to
2 twonies	*$80*
1 - $20	*$100*

d) $53 to $60

Need	To get to
1 twonie	*$55*
1 - $5	*$60*

e) $62 to $80

Need	To get to
1 loonie	*$63*
1 twonie	*$65*
1 - $5	*$70*
1 - $10	*$80*

f) $17 to $50

Need	To get to
1 loonie	*$18*
1 twonie	*$20*
1 - $10	*$30*
1 - $20	*$50*

g) $92 to $100

Need	To get to
1 loonie	*$93*
1 twonie	*$95*
1 - $5	*$100*

h) $26 to $50

Need	To get to
2 twonies	*$30*
1 - $20	*$50*

i) $46 to $60

Need	To get to
2 twonies	*$50*
1 - $10	*$60*

j) $73 to $80

Need	To get to
1 twonie	*$75*
1 - $5	*$80*

k) $83 to $100

Need	To get to
1 twonie	*$85*
1 - $5	*$90*
1 - $10	*$100*

l) $4 to $20

Need	To get to
1 loonie	*$5*
1 - $5	*$10*
1 - $10	*$20*

m) $37 to $50

Need	To get to
2 twonies	*$40*
1 - $10	*$50*

n) $98 to $100

Need	To get to
1 twonie	*$100*

o) $63 to $80

Need	To get to
1 twonie	*$65*
1 - $5	*$70*
1 - $10	*$80*

p) $42 to $50

Need	To get to
1 loonie	*$43*
1 - twonie	*$45*
1 - $5	*$50*

q) $19 to $50

Need	To get to
1 loonie	*$20*
1 - $10	*$30*
1 - $20	*$50*

t) $31 to $50

Need	To get to
2 twonies	*$35*
1 - $5	*$40*
1 - $10	*$50*

r) $23 to $50

Need	To get to
1 twonie	*$25*
1 - $5	*$30*
1 - $20	*$50*

u) $89 to $100

Need	To get to
1 loonie	*$90*
1 - $10	*$100*

s) $56 to $100

Need	To get to
2 twonies	*$60*
2 - $20	*$100*

v) $32 to $50

Need	To get to
1 loonie	*$33*
1 twonie	*$35*
1 - $5	*$40*
1 - $10	*$50*

Exercise Five

State the number and kind of coins and bills you would need to get change from $100. Make sure you use the least number of coins and bills as possible. Check your work using the answer key at the end of the exercise.

Example: $65 to $100

Need	To get to
1 - $5 bill	**$70**
1 - $10 bill	**$80**
1 - $20 bill	**$100**

a) $26

Need	To get to

d) $13

Need	To get to

b) $57

Need	To get to

e) $49

Need	To get to

c) $38

Need	To get to

f) $74

Need	To get to

g) $81

Need	To get to

j) $8

Need	To get to

h) $70

Need	To get to

k) $66

Need	To get to

i) $29

Need	To get to

l) $12

Need	To get to

m) $7

Need	To get to

p) $83

Need	To get to

n) $39

Need	To get to

q) $97

Need	To get to

o) $52

Need	To get to

r) $48

Need	To get to

s) $61

Need	To get to

u) $91

Need	To get to

t) $26

Need	To get to

v) $67

Need	To get to

Answers to Exercise Five

a) $26

Need	To get to
2 twonies	*$30*
1 - $10	*$40*
3 - $20	*$100*

b) $57

Need	To get to
1 twonie	*$40*
3 - $20	*$100*

c) $38

Need	To get to
1 twonie	*$40*
3 - $20	*$100*

d) $13

Need	To get to
1 twonie	*$15*
1 - $5	*$20*
4 - $20	*$100*

e) $49

Need	To get to
1 loonie	*$50*
1 - $10	*$60*
2 - $20	*$100*

f) $74

Need	To get to
1 loonie	*$75*
1 - $5	*$80*
1 - $20	*$100*

g) $81

Need	To get to
2 twonies	*$85*
1 - $5	*$90*
1 - $10	*$100*

h) $70

Need	To get to
1 - $10	*$80*
1 - $20	*$100*

i) $29

Need	To get to
1 loonie	*$30*
1 - $10	*$40*
3 - $20	*$100*

j) $8

Need	To get to
1 twonie	*$10*
1 - $10	*$20*
4 - $20	*$100*

k) $66

Need	To get to
2 twonies	$70
1 - $10	$80
1 - $20	$100

l) $12

Need	To get to
1 loonie	*$13*
1 twonie	*$15*
1 - $5	*$20*
4 - $20	*$100*

m) $7

Need	To get to
1 loonie	*$8*
1 twonie	*$10*
1 - $10	*$20*
4 - $20	*$100*

n) $39

Need	To get to
1 loonie	*$40*
3 - $20	*$100*

o) $52

Need	To get to
1 loonie	*$53*
1 twonie	*$55*
1 - $5	*$60*
2 - $20	*$100*

p) $83

Need	To get to
1 twonie	*$85*
1 - $5	*$90*
1 - $10	*$100*

q) $97

Need	To get to
1 loonie	*$98*
1 twonie	*$100*

r) $48

Need	To get to
1 twonie	*$50*
1 - $10	*$60*
2 - $20	*$100*

s) $61

Need	To get to
2 twonies	*$65*
1 - $5	*$70*
1 - $10	*$80*
1 - $20	*$100*

t) $26

Need	To get to
2 twonies	*$30*
1 - $10	*$40*
3 - $20	*$100*

u) $91

Need	To get to
2 twonies	*$95*
1 - $5	*$100*

v) $67

Need	To get to
1 loonie	*$68*
1 twonie	*$70*
1 - $10	*$80*
1 - $20	*$100*

Exercise Six

State the number and kind of coins and bills you would need to get from the first number to the second number. Make sure you use the least number of coins and bills as possible. Check your work using the answer key at the end of the exercise.

Example A: $2.69 from $5.00

Need	To get to
1 penny	$2.70
1 nickel	$2.75
1 quarter	$3.00
1 twonie	$5.00

Example B: $6.29 from $10.00

Need	To get to
1 penny	$6.30
2 dimes	$6.50
2 quarter	$7.00
1 loonie	$8.00
1 twonie	$10.00

Example C: $12.49 from $20.00

Need	To get to
1 penny	$12.50
2 quarters	$13.00
1 twonie	$15.00
1 - $5 bill	$20.00

a) $2.19 from $10.00

Need	To get to

d) $3.35 from $10.00

Need	To get to

b) $6.48 from $20.00

Need	To get to

e) $17.81 from $20.00

Need	To get to

c) $8.67 from $20.00

Need	To get to

f) $50.22 from $60.00

Need	To get to

g) $20.51 from $40.00

Need	To get to

h) $37.72 from $50.00

Need	To get to

i) $19.87 from $50.00

Need	To get to

j) $4.36 from $5.00

Need	To get to

k) $44.54 from $60.00

Need	To get to

l) $29.14 from $40.00

Need	To get to

m) $65.76 from $80.00

Need	To get to

p) $32.02 from $35.00

Need	To get to

n) $41.98 from $60.00

Need	To get to

q) $58.27 from $100

Need	To get to

o) $97.69 from $100

Need	To get to

r) $61.15 from $80.00

Need	To get to

s) $72.84 from $100

Need	To get to

u) $5.23 from $20.00

Need	To get to

t) $83.91 from $100

Need	To get to

v) $19.56 from $40.00

Need	To get to

Answers to Exercise Six

a) $2.19 from $10.00

Need	To get to
1 - penny	*$2.20*
1 - nickel	*$2.25*
3 - quarters	*$3*
1 twonie	*$5*
1 - $5	*$10*

b) $6.48 from $20.00

Need	To get to
2 - penny	*$6.50*
2 - quarters	*$7*
1 loonie	*$8*
1 twonie	*$10*
1 - $10	*$20*

c) $8.67 from $20.00

Need	To get to
3 - pennies	*$8.70*
1 - nickel	*$8.75*
1 - quarter	*$9*
1 loonie	*$10*
1 - $10	*$20*

d) $3.35 from $10.00

Need	To get to
1 - nickel	*$3.40*
1 - dime	*$3.50*
2 - quarters	*$4*
1 loonie	*$5*
1 - $5	*$10*

e) $17.81 from $20.00

Need	To get to
4 – pennies	*$17.85*
1 – nickel	*$17.90*
1 - dime	*$18*
1 twonie	*$20*

f) $50.22 from $60.00

Need	To get to
3 – pennies	*$50.25*
3 - quarters	*$51*
2 twonies	*$55*
1 - $5	*$60*

g) $20.51 from $40.00

Need	To get to
4 - pennies	*$20.55*
2 - dimes	*$20.75*
1 - quarters	*$21*
2 twonies	*$25*
1 - $5	*$30*
1 - $10	*$40*

h) $37.72 from $50.00

Need	To get to
3 – pennies	*$37.75*
1 - quarters	*$38*
1 twonie	*$40*
1 - $10	*$50*

i) $19.87 from $50.00

Need	To get to
3 – pennies	*$19.90*
1 - dime	*$20*
1 - $10	*$30*
1 - $20	*$50*

j) $4.36 from $5.00

Need	To get to
4 – pennies	*$4.40*
1 – dimes	*$4.50*
2 - quarters	*$5*

k) $44.54 from $60.00

Need	To get to
1 – penny	*$44.55*
2 - dimes	*$44.75*
1 - quarter	*$45*
1 - $5	*$50*
1 – $10	*$60*

l) $29.14 from $40.00

Need	To get to
1 – penny	*$29.15*
1 - dime	*$29.25*
3 - quarters	*$30*
1 - $10	*$40*

m) $65.76 from $80.00

Need	To get to
4 - pennies	*$65.80*
2 - dimes	*$66*
2 twonies	*$70*
1 - $10	*$80*

n) $41.98 from $60.00

Need	To get to
2 - pennies	*$42*
1 loonie	*$43*
1 twonie	*$45*
1 - $5	*$50*
1 - $10	*$60*

o) $97.69 from $100

Need	To get to
1 – penny	*$97.70*
1 – nickel	*$97.75*
1 - quarter	*$98*
1 twonie	*$100*

p) $32.02 from $35.00

Need	To get to
3 - pennies	*$32.05*
2 - dimes	*$32.25*
3 - quarters	*$33*
1 twonie	*$35*

q) $58.27 from $100

Need	To get to
3 - pennies	*$58.30*
2 - dimes	*$58.50*
2 - quarters	*$59*
1 loonie	*$60*
2 - $20	*$100*

r) $61.15 from $80.00

Need	To get to
1 - dime	*$61.25*
3 - quarters	*$62*
1 loonie	*$63*
1 twonie	*$65*
1 - $5	*$70*
1 - $10	*$80*

s) $72.84 from $100

Need	To get to
1 – penny	*$72.85*
1 – nickel	*$72.90*
1 - dime	*$73*
1 twonie	*$75*
1 - $5	*$80*
1 - $20	*$100*

u) $5.23 from $20.00

Need	To get to
2 – pennies	*$5.25*
3 - quarters	*$6*
2 twonies	*$10*
1 - $10	*$20*

t) $83.91 from $100

Need	To get to
4 – pennies	*$83.95*
1 - nickel	*$84*
1 loonie	*$85*
1 - $5	*$90*
1 - $10	*$100*

v) $19.56 from $40.00

Need	To get to
4 – pennies	*$19.60*
1 – nickel	*$19.65*
1 - dime	*$19.75*
1 - quarter	*$20*
1 - $20	*$40*

Exercise Seven

State the number and kind of coins and bills you would need to get from the first number to the second number. Make sure you use the least number of coins and bills as possible. Check your work using the answer key at the end of the exercise.

a) $1.74 from $10.00

Need

b) $54.05 from $60.00

Need

c) $96.43 from $100

Need

e) $73.97 from $80.00

Need

d) $28.16 from $40.00

Need

f) $32.81 from $50

Need

g) $9.38 from $20

Need

i) $16.32 from $50

Need

h) $85.25 from $100

Need

j) $48.03 from $50

Need

k) $64.70 from $100

Need

m) $21.51 from $40

Need

l) $59.69 from $100

Need

n) $7.62 from $20

Need

o) $18.47 from $50

Need

q) $83.26 from $100

Need

p) $37.82 from $50

Need

r) $46.93 from $50

Need

s) $75.15 from $80

Need

u) $92.58 from $100

Need

t) $69.40 from $100

Need

v) $31.60 from $40

Need

Answers to Exercise Seven

a) $1.74 from $10.00

Need
1 – penny
1 - quarter
1 loonie
1 twonie
1 - $5

b) $54.05 from $60.00

Need
2 – dimes
3 - quarters
1 - $5

c) $96.43 from $100

Need
2 – pennies
1 – nickel
2 - quarters
1 loonie
1 twonie

d) $28.16 from $40.00

Need
4 – pennies
1 – nickel
3 - quarters
1 loonie
1 - $10

e) $73.97 from $80.00

Need
3 - pennies
1 loonie
1 - $5

f) $32.81 from $50

Need
4 - pennies
1 – nickel
1 - dime
1 twonie
1 - $5
1 - $10

g) $9.38 from $20

Need
2 pennies
1 dime
2 quarters
1 - $10

h) $85.25 from $100

Need
3 quarters
2 twonies
1 - $10

i) $16.32 from $50

Need
3 pennies
1 nickel
1 dime
1 loonie
1 twonie
1 - $10, 1 - $20

j) $48.03 from $50

Need
2 pennies
2 dimes
3 quarters
1 loonie

k) $64.70 from $100

Need
1 nickel
1 quarter
1 - $5
1 - $10
1 - $20

l) $59.69 from $100

Need
1 penny
1 nickel
1 quarter
2 - $20

m) $21.51 from $40

Need
4 pennies
2 dimes
1 quarter
1 loonie
1 twonie
1 - $5, 1 - $10

n) $7.62 from $20

Need
3 pennies
1 dime
1 quarter
1 twonie
1 - $10

o) $18.47 from $50

Need
3 pennies
2 quarters
1 loonie
1 - $10
1 - $20

p) $37.82 from $50

Need
3 pennies
1 nickel
1 dime
1 - twonie
1- $10

q) $83.26 from $100

Need
4 pennies
2 dimes
2 quarters
1 loonie
1- $5
1- $10

r) $46.93 from $50

Need
2 pennies
1 nickel
1 loonie
1 twonie

s) $75.15 from $80

Need
1 dime
3 quarters
2 twonies

t) $69.40 from $100

Need
1 dime
2 quarters
1 - $10
1 - $20

u) $92.58 from $100

Need
2 pennies
1 nickel
1 dime
1 quarter
1 twonie
1 - $5

v) $31.60 from $40

Need
1 nickel
1 dime
1 quarter
1 loonie
1 twonie
1 - $5

w) $0.59 from $5

Need
1 penny
1 nickel
1 dime
1 quarter
2 twonies

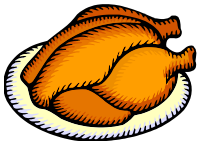
x) $84.74 from $100

Need
1 penny
1 quarter
1 - $5
1 - $10

Exercise Eight

State the number and kind of coins and bills you would need to get change from $100. Make sure you use the least number of coins and bills as possible. Check your work using the answer key at the end of the exercise.

a)



2 kg of chicken for $24.59

b)

DVD Player for $25.73

c)

Metal shelf for $75.59

d)

Heavy duty drill costs $89.89

e)

Skates cost $67.49

f)

Floor lamp costs $73.91

g)

coffee maker costs $22.39

h)

a package of toilet paper costs $6.71

i)

a box of laundry detergent costs $13.43

j)

a can of baby formula costs $30.23

Answers to Exercise Eight

a) 1 penny, 1 nickel, 1 dime, 1 quarter, 1 - $5, 1 - $10, 3 - $20

b) 2 pennies, 1 quarter, 2 twonies, 1 - $10, 3 - $20

c) 1 penny, 1 nickel, 1 dime, 1 quarter, 2 twonie, 1 - $20

d) 1 penny, 1 dime, 1 - $10

e) 1 penny, 2 quarters, 1 twonie, 1 - $10, 1 - $20

f) 4 pennies, 1 nickel, 1 loonie, 1 - $5, 1 - $20

g) 1 penny, 1 dime, 2 quarters, 1 twonie, 1 - $5, 1 - $10, 3 - $20

h) 4 pennies, 1 quarter, 1 loonie, 1 twonie, 1 - $10, 4 - $20

i) 2 pennies, 1 nickel, 2 quarters, 1 loonie, 1 - $5, 4 - $20

j) 2 pennies, 3 quarters, 2 twonies, 1 - $5, 3 - $20

Exercise Nine

State the number and kind of coins and bills you would need to get change from $100. Make sure you use the least number of coins and bills as possible. Check your work using the answer key at the end of the exercise.

a) Mrs. Bhabra bought a food processor that cost $55.99. What change will she get from $100?

b) Pablo bought Lego for $30.23. What change will she get from $100?

c) A case of 6 bottles of motor oil costs $43.67. What change will you get from $100?

d) Shampoo costs $3.99 and conditioner costs $4.99. Together with taxes they cost $10.06. What change will you get from $100?

Answers to Exercise Nine

a) 1 penny, 2 twonies, 2 - $20

b) 2 pennies, 3 quarters, 2 twonies, 1 - $5, 3 - $20

c) 3 pennies, 1 nickel, 1 quarter, 1 loonie, 1 - $5, 1 - $10, 2 - $20

d) 4 pennies, 1 nickel, 1 dime, 3 quarters, 2 twonies, 1 - $5, 4 - $20

Topic B: Self-Test

Mark /21 Aim 17/21

A. Circle the number of coins and bills needed to get from the first number to the second number. Use the least number of coins. 4 marks

a) $76 to $80

b) $22 to $25

c) $40 to $50

d) $55 to $60

B. State the number and kind of coins or bills are needed to get from the first number to the second number. 4 marks

a) $48 to $50

b) $76 to $80

c) $95 to $100

d) $40 to $50

C. State the number and kind of coins and bills you would need to get from the first number to the second number. Make sure you use the least number of coins and bills as possible. 4 marks

a) $37 to $50

b) $16 to $50

c) $42 to $60

d) $81 to $100

D. State the number and kind of coins and bills you would need to get change from $100. Make sure you use the least number of coins and bills as possible. (9 marks)

a) $23

b) $41

c) $68

d) $72

e) groceries cost $89.63

f) telephone bill was $51.08

g) gas for the car cost $61.59

h) Mr. Czelinski bought a new vacuum cleaner for $86.32. What change will get from $100?

i) Mrs. Uchida bought a new frying pan for $39.19. How much change will she get back from $100?

Answers to Topic B Self-Test

A.

a) 2 twonies b) 1 loonie, 1 twonie c) 1 - $10 d) 1 - $5

B.

a) 1 twonie b) 2 twonies c) 1 - $5 d) 1 - $10

C.

a) 1 loonie, 1 twonie, 1 - $10
b) 2 twonies, 1- $10, 1 - $20
c) 1 loonie, 1 twonie, 1 - $5, 1 - $10
d) 2 twonies, 1 - $5, 1 - $10

D.

a) 1 twonie, 1 - $5, 1 - $10, 3 - $20
b) 2 twonies, 1 - $5, 1 - $10, 2 - $20
c) 1 twonie, 1 - $10, 1 - $20
d) 1 loonie, 1 twonie, 1 - $5, 1 - $20
e) 2 pennies, 1 dime, 1 quarter, 1 - $10
f) 2 pennies, 1 nickel, 1 dime, 3 quarters, 1 loonie, 1 twonie, 1 - $5, 2 - $20
g) 1 penny, 1 nickel, 1 dime, 1 quarter, 1 loonie, 1 twonie, 1 - $5, 1 - $10, 1 - $20
h) 3 pennies, 1 nickel, 1 dime, 2 quarters, 1 loonie, 1 twonie, 1 - $10
i) 1 penny, 1 nickel, 3 quarters, 3 - $20

Topic C: Converting Units of Time

When working with time units, sometimes you will need to convert from one unit of time to another. You must multiply or divide by the factors (such as 60 min = 1 h, 7 days = 1 week) shown below.

CONVERSION FACTORS
60 seconds = 1 minute
60 minutes = 1 hour
24 hours = 1 day
7 days = 1 week
365 days = 1 year

To convert from smaller time units to larger time units, divide.

- To convert seconds to minutes, divide by 60 (60 s = 1)
- To convert minutes to hours, divide by 60 (60 min = 1 h)
- To convert hours to days, divide by 24 (24 h = 1 d)

To convert seconds to minutes

Use conversion factor: 60 seconds = 1 minute

number of seconds ÷ 60 = number of minutes

Example A: 85 seconds = __ min

85 ÷ 60 = 1 R25

$$\begin{array}{r} 1 \\ 60\overline{)85} \\ \underline{60} \\ 25 \end{array}$$

85 s = 1 min, 25 s

Example B: 125 seconds = __ min

125 ÷ 60 = 2 R5

$$\begin{array}{r} 2 \\ 60\overline{)125} \\ \underline{120} \\ 5 \end{array}$$

125 s = 2 min, 5s

To convert minutes to hours:

Use conversion factor: 60 minutes = 1 hour

min ÷ 60 = h

Example A: 97 minutes = __ hours

97 min ÷ 60 = 1R37

$$\begin{array}{r} 1 \\ 60\overline{)97} \\ \underline{60} \\ 37 \end{array}$$

97 min = 1 h, 37 min

Example B: **180 minutes = __ hours**

$180 \div 60 = 3$

$$60\overline{)180}\quad \begin{array}{r} 3 \\ 180 \\ \hline 0 \end{array}$$

180 min = 3 h

To convert hours to days:

Use conversion factor: 24 hours = 1 day

number of hours ÷ 24 = number of days

Example A: **50 hours = __ days**

$50 \div 24 = 2$ R2

$$24\overline{)50}\quad \begin{array}{r} 2 \\ 48 \\ \hline 2 \end{array}$$

50 h = 2 d, 2 h

Example B: **72 hours = __ days**

$72 \div 24 = 3$

$$24\overline{)72}\quad \begin{array}{r} 3 \\ 72 \\ \hline 0 \end{array}$$

72 h = 3 d

Exercise One

Convert the time units. The answers should be in the *simplest form*. Check your work using the answer key at the end of the exercise.

a) 260 min = *4* h, *20* min

$$60\overline{)260}\quad 4,\ 240,\ 20$$

b) 80 s = _____ min, _____ s

c) 75 min = _____ h, _____ min

d) 105 min = _____ h, _____ min

e) 200 s = _____ min, _____ s

f) 29 h = _____ d, _____ h

g) 36 h = _____ d, _____ h

h) 90 h = _____ d, _____h

i) 220 s = _____ min, _____ s

j) 78 h = _____ d, _____ h

k) 240 min = _____ h, _____ min

l) 155 s = _____min, _____ s

m) 50 h = _____ d, _____ h

n) 190 min = _____h, _____ m

o) 140 s = _____ min, _____ s

p) 274 m = _____ h, _____ min

q) 415 d = _____y, _____ d

r) 724 d = _____y, _____ d

Answers to Exercise One

a) 4 h, 20 min	b) 1 min, 20 s	c) 1 h, 15 min	d) 1 h, 45 min
e) 3 min, 20 s	f) 1 d, 5 h	g) 1 d, 12 h	h) 3 d, 18 h
i) 3 min, 40 s	j) 3 h, 6 h	k) 4 h, 0 min	l) 2 min, 35 s
m) 2 d, 2 h	n) 3 h, 10 min	o) 2 min, 20 s	p) 4 h, 34 min
q) 1 y, 50 d	r) 1 y, 359 d		

If you are adding amounts of time for time-sheets or other records, you will often have a total such as the ones shown in the following examples.

Example A: **7 h, 85 min**

Convert the 85 min to hours

85 min ÷ 60 = 1 h, 25 min

$$60\overline{)85}\quad 1,\ 60,\ 25$$

Add the 1 h, 25 min to the 7 h

7 h + 1 h, 25 min = 8 h, 25 min

Example B: **40 h, 268 min**

Convert the 268 min to hours

268 ÷ 60 = 4 h, 28 min

$$60\overline{)268}\quad 4,\ 240,\ 28$$

Add the 4 h, 28 min to the 40 h

40 h + 4 h, 28 min = 44 h, 28 min

Exercise Two

Convert the time units. The answers should be in the *simplest form*. Check your work using the answer key at the end of the exercise.

a) 35 h, 90 min = _____ h, _____ min

b) 2 h, 75 min = _____ h, _____ min

c) 2 min, 130 s = _____ min, _____ s

d) 9 min, 450 s = _____min, _____s

e) 2 d, 27 h = _____ d, _____ h

f) 8 d, 75 h = _____ d, _____ h

g) 4 min, 170 s = _____min, _____s

h) 5 d, 85 h = _____d, _____ h

i) 46 h, 398 min = _____ h, _____ min

j) 29 d, 168 h = _____ d, _____ h

k) 48 min, 163 s = _____ min, _____ s

l) 11 h, 163 min = _____ h, _____ min

m) 38 h, 318 min = _____ h, _____ min

n) 17 min, 212 s = _____ min _____ s

o) 51 min, 178 s = _____ min, _____ s

p) 8 d, 169 h = _____ d, _____ h

q) 52 d, 78 h = _____ d, _____ h

r) 41 h, 215 min = _____ h, _____ min

Answers to Exercise Two

a) 36 h, 30 min	b) 3 h, 15 min	c) 4 min, 10 s	d) 16 min, 30 s
e) 3 d, 3 h	f) 11 d, 3 h	g) 6 min, 50 s	h) 8 d, 13 h
i) 52 h, 38 min	j) 36 d, 0 h	k) 50 min, 43 s	l) 13 h, 43 min
m) 43 h, 18 min	n) 20 min, 32 s	o) 53 min, 58 s	p) 15 d, 1 h
q) 55 d, 6 h	r) 44 h, 35 min		

Adding Units of Time

- Place the numbers to be added in columns with like units - min with min, h with h, s with s
- Add each column, being sure to write the correct unit of time
- Convert the answer in each column to simplest form and carry units to be added onto the next column as needed.

Example A:

$$\begin{array}{r} 12 \text{ h, } 45 \text{ min} \\ +\ 10 \text{ h, } 30 \text{ min} \\ \hline 22 \text{ h, } 75 \text{ min} \end{array}$$

Convert: 75 min = 1 hr, 15 min
Add: 22 h + 1 h, 15 min = **23 h, 15 min**

Example B:

$$\begin{array}{r} 4 \text{ h, } 50 \text{ min, } 55 \text{ s} \\ +\ 21 \text{ h, } 120 \text{ min, } 40 \text{ s} \\ \hline 25 \text{ h, } 170 \text{ min, } 95 \text{ s} \end{array}$$

Convert: 95 s = 1 min, **35 s**
Add: 170 min + 1 min = 171 min

Convert: 171 min = 2 h, **51 min**
Add: 25 h + 2 h = 27 h

Convert: 27 h = **1 d, 3 h**

The final answer is **1 d, 3 h, 51 min, 35 s**

Exercise Three

Add the times. Check your work using the answer key at the end of the exercise.

a) 5 h, 40 min
+ 4 h, 45 min

b) 12 h, 30 min
+ 15 h, 30 min

c) 4 h, 55 min, 30 s
+ 7 h, 30 min, 45 s

d) 19 h, 50 min
+ 25 h, 40 min

e) 3 h, 30 min
+ 5 h, 40 min
4 h, 45 min
+ 6 h, 30 min

f) 2 h, 25 min, 8 s
+ 12 h, 30 min, 10 s
8 h, 45 min, 55 s
+ 10 h, 20 min, 30 s

Answers to Exercise Three

a) 10 h, 25 min b) 28 h, 0 min c) 12h, 26 min, 15 s d) 45 h, 30 min
e) 20 h, 25 min f) 34 h, 1 min, 43 s

To convert from larger time units to smaller time units, multiply.

- To convert hours to minutes, multiply by 60 (1 h = 60 min)
- To convert minutes to seconds, multiply by 60 (1 min = 60 s)
- To convert days to hours, multiply by 24 (1 d = 24 h)

To convert minutes to seconds

Use conversion factor: 1 minute = 60 seconds

number of minutes x 60 = number of seconds

Example A: **5 minutes = __ sec**

5 x 60 =

$$\begin{array}{r} 60 \\ \times\ 5 \\ \hline 300 \end{array}$$

5 min = 300 sec

To convert hours to minutes:

Example B: **24 hours = __ min**

24 x 60 =

$$\begin{array}{r} 24 \\ \times\ 60 \\ \hline 1\,440 \end{array}$$

24 h = 1 440 min

To convert days to hours:

Use conversion factor: 1 day = 24 hours

number of hours x 24 = number of hours

Example A: **7 days = __ days**

7 x 24 =

$$\begin{array}{r} 24 \\ \times\ 7 \\ \hline 168 \end{array}$$

7 d = 168 h

Example B: **4d, 10 h = ___ h**

4 x 24 =

$$\begin{array}{r} 24 \\ \times\ 4 \\ \hline 96 \end{array}$$

Example C: **14 min, 29 s = __ s**

14 x 60 =

$$\begin{array}{r} 14 \\ \times\ 60 \\ \hline 840 \end{array}$$

840 + 29 = 689 s

14 min, 29 s = 869 s

Exercise Four

Convert the time units. The answers should be in the *simplest form.* Check your work using the answer key at the end of the exercise.

a) 4 d = ____ h

b) 6 h = ____ min

c) 10 min = ____ s

d) 5 h = ____ min

e) 1 h, 15 min = ____ min

f) 10 min, 30 s = ____ s

g) 2 d, 12 h = ____ h

h) 20 min, 2 s = ____ s

Answers to Exercise Four

a) 96 h b) 360 min c) 600 s d) 300 min e) 75 min f) 630 s g) 60 h h) 1 202 s

Subtracting Units of Time

- Place the numbers to be subtracted in columns with like units.
- Subtract each column, being sure to write the correct units of time. Borrow from the next larger unit of time as needed (see examples)
- Convert the answer to the simplest form.

Example A:

2 h, 40 min
- 1 h, 50 min

50 min cannot be subtracted from 40 min
Borrow 1 h and convert it to minutes to be added to the 40 min

1 h = 60 min 60 min + 40 min = 100 min

The question now looks like this:

1 h, 100 min
- 1 h, 50 min
0 h, 50 min The difference is 50 min

Example B:

5 h, 20 min, 10 s
- 2 h, 35 min, 45 s

Borrow 1 min and convert it to 60 seconds to be added to the 10 seconds

1 min = 60 s 60 s + 10 s = 70 s

The question now looks like this:

5 h, **19 min, 70 s**
- 2 h, 35 min, 45 s
25 s

Borrow 1 h and convert it to 60 min to be added to the 19 min

1 h = 60 min 60 min + 19 min = 79 min

4 h, 79 min, 70 s
- 2 h, 35 min, 45 s
2 h, 44 min, 25 s

The difference is 2 h, 44 min, 25 s.

Exercise Five

Subtract these units of time. Check your work using the answer key at the end of the exercise.

a) 4 h, 2 min
- 2 h, 25 min

b) 5 d, 10 h
- 1 d, 14 h

c) 2 h, 45 min, 12 s
- 50 min, 30 s

d) 4 h, 30 min, 10 s
- 2 h, 25 min, 25 s

e) 2 min, 45 s
- 1 min, 47 s

f) 4 d, 5 h, 16 min
- 2 d, 20 h, 45 min

g) 5 h
- 2 h, 30 min

h) 3 d, 10 h, 45 min
- 22 h

Answers to Exercise Five

a) 1 h, 37 min
b) 3 d, 20 h
c) 1 h, 54 min, 42 s
d) 2 h, 4 min, 45 s
e) 58 s
f) 1 d, 8 h, 31 min
g) 2 h, 30 min
h) 2 d, 12 h, 45 min

Multiplying Units of Time

Multiplying units of time is a practical skill. For example, you may need to figure out the hours you have worked in a week or what you owe the baby-sitter.

To multiply units of time, do this:

- Multiply each unit separately.
- Simplify the answer.

Example A: Joan worked 5 hours and 15 minutes on 3 days last week. How much did she work?

$$\begin{array}{r} 5\text{ h}, 15\text{ min} \\ \times\ 3 \\ \hline 15\text{ h}, 45\text{ min} \end{array}$$

Joan worked 15 h, 45 min.

Example B: Doug worked 7 shifts at the sawmill last month. Each shift is 7 hours, 45 minutes. How much time did he work?

$$\begin{array}{r} 7\text{ h}, 45\text{ min} \\ \times\ 7 \\ \hline 49\text{ h}, 315\text{ min} \end{array}$$

convert 315 min to h $315 \div 60 = 5$ h, 30 min

49 h + 5 h, 30 min = 54 h, 30 min worked

Doug worked 54 h, 30 min.

Exercise Six

Multiply and write the answers in simplest form. Check your work using the answer key at the end of the exercise.

a) 5 h, 20 min $\times$ 8 =

b) 12 h, 15 min $\times$ 10 =

c) 15 min, 40 s $\times$ 5 =

d) 7 h, 30 min $\times$ 5 =

e) 20 h $\times$ 6 =

f) 4 h, 30 min, 45 s $\times$ 2 =

g) If you go to school four days per week and take a 45 min lunch and 40 min in coffee breaks each day, how much time do you spend on lunch and coffee breaks at school each week?

h) Juanita spends 10 min driving to the Park and Ride, 5 min waiting for the bus, 15 min on the bus and 15 min on the Sky Train and then 5 min walking to her office every work day. She spends the same amount of commuting time on the way home.

i) How much time does she spend commuting each day?

ii) Juanita works 230 days in a year. How much time is she spending commuting in a year?

Answers to Exercise Six

a) 42 h, 40 min
b) 5 d, 2 h, 30 min
c) 1 h, 18 min, 20 s
d) 1 d, 13 h, 30 min
e) 5 d
f) 9 h, 1 min, 30 s
g) 5 h, 40 min
h) i) 1 h, 40 min
ii) 15 d, 23 h, 20 min

Topic C: Self-Test

Mark /33 Aim 26/33

A. Convert the units of time. The answer should be in *simplest form*. 8 marks

a) 120 s = _____ min

b) 360 min = _____ h

c) 144 h = _____d

d) 730 d = _____y

e) 100 h = _____ d, _____ h

f) 343 s = _____ min, _____ s

g) 373 min = _____ h, _____min

h) 564 d = _____ y, _____ d

B. Convert the units of time. The answer should be in *simplest form*. 6 marks

a) 3 d, 36 h = _____d, _____h

b) 8 min, 98 s = _____min, _____s

c) 5 h, 80 min = _____h, _____ min

d) 7 h, 136 min = _____h, _____min

e) 4 d, 78 h = _____d, _____h

f) 6 min, 143 s = _____min, ____s

C. Add the units of time. The answer should be in *simplest form*. 4 marks

a) 10 min, 12 s
15 min, 52 s

b) 8 h, 52 min
7 h, 44 min

c) 5 h, 47 min, 25 s
6 h, 15 min, 48 s

d) 2 h, 29 min
4 h, 38 min
3 h, 16 min

D. Convert the units of time. 6 marks

a) 7 d = _____ h

b) 15 min = _____ s

c) 5 h = _____ min

d) 3 hr, 11 min = _____min

e) 18 min, 9 s = _____ s

f) 5 d, 3 h = _____ h

E. Subtract the units of time. The answer should be in *simplest form.* 4 marks

a) $\begin{array}{r} 41\text{ min, }10\text{ s} \\ -\ 32\text{ min, }45\text{ s} \\ \hline \end{array}$

b) $\begin{array}{r} 24\text{ h, }22\text{ min} \\ -\ 19\text{ h, }58\text{ min} \\ \hline \end{array}$

c) $\begin{array}{r} 55\text{ h, }17\text{ min} \\ -\ 32\text{ h, }39\text{ min} \\ \hline \end{array}$

d) $\begin{array}{r} 17\text{ h, }11\text{ min, }32\text{ s} \\ -\ 3\text{ h, }28\text{ min, }47\text{ s} \\ \hline \end{array}$

F. Multiply the units of time. The answer should be in *simplest form*. 4 marks

a) $\begin{array}{r} 3\text{ h, }15\text{ min} \\ \times\ 3 \\ \hline \end{array}$

b) $\begin{array}{r} 42\text{ min, }12\text{ s} \\ \times\ 4 \\ \hline \end{array}$

c) $\begin{array}{r} 4\text{ min, }23\text{ s} \\ \times\ 3 \\ \hline \end{array}$

d) $\begin{array}{r} 5\text{h, }21\text{ min, }32\text{ s} \\ \times\ 4 \\ \hline \end{array}$

e) Benito spends 1 h, 38 min at the gym four times a week. How much does he spend at the gym in a week?

Answers to Topic C Self-Test

A.

a) 2 min b) 6 h c) 6 d d) 2 y e) 4 d, 4 h f) 5 min, 43 s
g) 6 h, 13 min h) 1 y, 199 d

B.

a) 4 d, 12 h b) 9 min, 38 s c) 6 h, 20 min. d) 9 h, 16 min
e) 7 d, 6 h f) 8 min, 23 s

C.

a) 26 min, 4 s b) 16 h, 36 min c) 12 h, 3 min, 13 s d) 10 h, 13 min

D.

a) 168 h b) 900 s c) 300 min d) 191 min
e) 1 089 s f) 123 h

E.

a) 8 min, 25 s b) 4 h, 24 min c) 22 h, 38 min d) 13 h, 42 min, 45 s

F.

a) 9 h, 45 min b) 2 h, 48 min, 48 s c) 13 min, 9 s d) 21 h, 26 min, 8 s
e) 6 h, 32 min

Topic D: The Metric System

When you measure something, you are **comparing**. Measurement is comparing something with a **standard unit of measure**.

In the past, units of measure were based on things found in a community. Often, lengths of parts of the body were used to measuring.

Unit	Definition
the inch	the width of a thumb, later defined as 3 barley seeds end to end
the span	the distance from tip of thumb to tip of little finger when the hand is spread out
the foot	the distance from big toe to heel of foot
the yard (becomes "rod)	the distance from tip of nose to tip of thumb of an outstretched hand and arm
the cubit	the distance from the tip of the middle finger to the elbow
the fathom	the distance from the tip of one hand to the tip of the other with both arms stretched out
the mile	1 000 military double steps in the Roman army (*mile passuum* means "1 000 paces"

The problem with these units was the distances would be different based on the size of the person doing the measuring. The problem grew even more when trade was started between cities.

Over a long period of time, people in different countries came up with different standard units of measure.

The British came up with **imperial units** such as inch, foot, yard and mile.

The French came up with **metric units** such as metre, centimetre, litre and gram.

In Canada, we use both metric and imperial units.

Measuring Length

The basic unit of measure for length is the **metre** (abbreviation **m**). If you stretch your arm straight beside you, a **metre** is about the distance from the tip of your nose to the tip of your middle finger.

Exercise One

Answer yes or no if you would use a metre to measure. Check your work using the answer key at the end of the exercise.

Example: the length of a table ____yes____

the width of your watchband ____no___

	Item	Yes or No
a	length of your classroom	
b	thickness of a piece of paper	
c	length of your pen or pencil	
d	height of the door	
e	distance from Prince George to Fort Nelson	
f	the width of your baby finger	
g	the size of a postage stamp	
h	the thickness of a quarter	
i	the length of the hallway outside your classroom	
j	the distance from your home to college	
k	the height of your coffee mug	
l	the width of your book	
m	the distance from your home to Moncton, New Brunswick	
n	the length of a city bus	

Answers to Exercise One

a) yes b) no c) no d) yes e) no f) no g) no
h) no i) yes j) no k) no l) no m) no n) yes

Exercise Two

Estimate the length of each item. Remember a metre is about the distance from the tip of your nose to the tip of your middle finger when your arm is stretched out beside you. Be sure to include the unit of measure in your answer. Have your instructor check your work.

	Item	Estimate
a	the height of the doorway	
b	the height of your table	
c	the width of the doorway	
d	the length of your arm	
e	the distance from the floor to hip	
f	the distance from the floor to waist	
g	the height of the ceiling	
h	the width of the window	
i	the length of your classroom	
j	the width of your classroom	

Exercise Three

Circle the letter of the most reasonable measure. Remember a metre is about the distance from the tip of your nose to the tip of your middle finger when your arm is stretched out beside you. Check your work using the answer key at the end of the exercise.

a) A person's height
   a) 2 m
   b) 20 m
   c) 200 m

b) The height of a child
   a) 10 m
   b) 100 m
   c) 1 m

c) The length of a house
   a) 150 m
   b) 15 m
   c) 1 m

d) The length of a bed
   a) 200 m
   b) 2 m
   c) 20 m

e) The height of a building
   a) 1 m
   b) 100 m
   c) 10 m

f) The height of a refrigerator
   a) 20 m
   b) 200 m
   c) 2 m

Answers to Exercise Three

a) a b) c c) b d) b e) b f) c

Measuring Small Lengths and Long Distances

It is hard to measure small things using a metre. To measure small things, you can use **centimetre (cm) or millimetre (mm).**

A **centimetre (cm)** is about the width of your baby finger. Remember it is just a guide.

A **millimetre (mm)** is about the thickness of your fingernail.

It is hard to measure long distances using a metre. To measure long distances, you can use **kilometre (km).** A kilometre is 1 000 metres.

Exercise Four

For each item, circle the unit of measure you would use. Check your work using the answer key at the end of the exercise.

	Item	Unit of Measure
a	the width of a room	m cm mm
b	the thickness of a coin	m cm mm
c	the length of your pencil	m cm mm
d	the length of the hall	m cm mm
e	the length of this page	m cm mm
f	the length of a screw	m cm mm
g	the height of your cup	m cm mm
h	the length of a bus	m cm mm
i	the thickness of a window pane	m cm mm
j	the width of a chair	m cm mm

Answers to Exercise Four

a) m b) mm c) cm d) m e) cm f) mm g) cm
h) m i) mm j) cm

Exercise Five

For each item, circle the letter of the most reasonable unit of measure. Check your work using the answer key at the end of the exercise.

a) The width of a doorway
   a) 50 mm
   b) 1 m
   c) 50 cm

b) The length of your pencil
   a) 20 m
   b) 20 mm
   c) 20 cm

c) The height of a tall building
   a) 1 m
   b) 100 m
   c) 10 m

d) The height of a refrigerator
   a) 20 m
   b) 200 m
   c) 2 m

e) The diameter of a quarter
   a) 24 mm
   b) 24 cm
   c) 24 m

f) The height of the kitchen counter
   a) 9 m
   b) 9 cm
   c) 90 cm

g) The distance around your wrist
   a) 15 mm
   b) 15 cm
   c) 15 m

h) The width of a small TV screen
   a) 28 mm
   b) 28 cm
   c) 28 m

i) The length of a car
   a) 5 m
   b) 5 cm
   c) 5 mm

j) the height of a bookcase
   a) 2 cm
   b) 2 mm
   c) 2 m

Answers to Exercise Five

a) b b) c c) b d) c e) a f) c g) b
h) b i) a j) c

Exercise Six

Fill in the blank with the most reasonable unit of measure.
Check your work using the answer key at the end of the exercise.

a) Most hand held calculators are about 15 _____ long.

b) The CN Tower in Toronto is 555 _____ tall.

c) Many young men have an 80 _____ waist.

d) Computer monitor screens are 28 _____ wide.

e) The handle of a hammer is 20 _____ long.

f) A table is about 65 _____ long.

g) The seat of a chair is about 30 _____ above the floor.

h) The window is about 3 _____ long.

i) A roll of tape is about 13 _____ wide.

j) A rope is about 7 _____ thick.

Answers to Exercise Six

a) cm b) m c) cm d) cm e) cm f) cm g) cm
h) m i) mm j) mm

Measuring Capacity (Volume)

Volume is a measure of how much space something takes up. The basic unit of measure for volume is the **Litre (L)**.

Can you think of two things that we buy in litres? We buy gasoline and milk in litres.

We use **millilitres (mL)** to measure small volumes. For example, a small cup of coffee is about 180 mL. Can you think of two things we buy in mL?

Exercise Seven

Circle the unit of measure you would use to measure each item. Check your work using the answer key at the end of the exercise.

	Item	L or mL
a	Bottle of pop	
b	Gasoline	
c	Car window wash	
d	Can of beans	
e	Large bottle of juice	
f	Liquid dish soap	
g	Cough syrup	
h	Mixing bowls	
i	Ketchup	
j	Shampoo	
k	Vinegar	
l	Bathtub	
m	Ice cube tray	
n	Paint	

Answers to Exercise Seven

a) mL b) L c) L d) mL e) L f) mL or L g) mL
h) L i) mL or L j) mL k) L l) L m) mL n) L

Exercise Eight

Circle the letter of the most reasonable unit of measure.
Check your work using the answer key at the end of the exercise.

a) A can of soup
   a) 3 L
   b) 30 mL
   c) 300 mL

b) A large container of ice cream
   a) 5 L
   b) 500 mL
   c) 50 mL

c) A hot water heater
   a) 200 mL
   b) 50 L
   c) 200 L

d) A cup of tea
   a) 18 mL
   b) 180 mL
   c) 218 L

e) A garbage can
   a) 120 L
   b) 120 mL
   c) 12 L

f) A saucepan
   a) 2 L
   b) 20 L
   c) 2 mL

g) A dose of cough syrup
   a) 40 L
   b) 4 mL
   c) 40 mL

h) The gas tank of a car
   a) 500 mL
   b) 5 L
   c) 50 L

i) A jar of mustard
   a) 150 mL
   b) 15 L
   c) 15 mL

j) A large mixing bowl
   a) 6 mL
   b) 60 L
   c) 6 L

Answers to Exercise Eight

a) c b) a c) c d) b e) a f) a g) b
h) c i) a j) c

Measuring Mass

Mass is a measure of matter in something. The basic unit of measure for mass is the **gram (g)**. We buy sliced meats, bulk food, spices and cereal in grams.

We use **kilogram (kg)** to measure the mass of large things such as cars, people, flour and sugar. Can you think of two things that we buy in kilograms?

We use **milligram (mg)** to measure the mass of small things such as medicine or vitamins. A **milligram** is very small. Can you think of two things that we buy in milligrams?

Exercise Nine

Circle the unit of measure you would use to measure each item. Check your work using the answer key at the end of the exercise.

	Item	Unit of Measure		
a	Pasta	mg	g	kg
b	Vitamin C	mg	g	kg
c	Peanut butter	mg	g	kg
d	Flour	mg	g	kg
e	Nails	mg	g	kg
f	Dry dog food	mg	g	kg
g	Rice	mg	g	kg
h	Cookies	mg	g	kg
i	Apples	mg	g	kg
j	Spices	mg	g	kg
k	Cement	mg	g	kg
l	Medicine tablets	mg	g	kg
m	The family pet	mg	g	kg
n	A coin	mg	g	kg

Answers to Exercise Nine

a) g or kg b) mg c) g or kg d) kg e) kg f) kg g) kg
h) g i) kg j) mg k) kg l) mg m) kg n) mg

Exercise Ten

Circle the letter of the most reasonable unit of measure.
Check your work using the answer key at the end of the exercise.

a) A nickel
   a) 5 kg
   b) 5 g
   c) 50 g

b) A small television
   a) 8 g
   b) 8 kg
   c) 80 kg

c) A flashlight battery
   a) 8 g
   b) 8 kg
   c) 80 g

d) A small child
   a) 30 kg
   b) 3 kg
   c) 300 g

e) A dinner fork
   a) 50 g
   b) 5 g
   c) 5 kg

f) A slice of bread
   a) 2 g
   b) 20 g
   c) 2 kg

g) A sugar cube
   a) 2 mg
   b) 20 g
   c) 2 g

h) A refrigerator
   a) 120 g
   b) 120 kg
   c) 12 kg

i) A bag of potatoes
   a) 5 g
   b) 5 kg
   c) 50 mg

j) A car
   a) 100 kg
   b) 1 000 kg
   c) 10 kg

k) A chocolate bar
   a) 300 mg
   b) 300 kg
   c) 300 g

l) A back pack
   a) 12 kg
   b) 12 g
   c) 12 mg

Answers to Exercise Ten

a) c b) b c) a d) b e) a f) b g) c
h) b i) b j) b k) c l) a

Metric Prefixes

In the metric system a prefix is used to tell if something is large or small. A **prefix** is a part of a word that is added to the start of word to change the meaning.

The base units of measure in the metric system are the **metre (m), litre (L) and gram (g)**.

If the prefix **kilo** is added to one of the base units of measures, such as kilometre or kilogram, you know that these are large amounts.

A **kilometre** is 1 000 metres.
A **kilogram** is 1 000 grams.

If the prefix **centi or milli** is added to one of the base units of measure, such as centimetre or milligram, you know that these are small amounts.

It takes 100 **centimetres** to make a metre.
It takes 1 000 **milligrams** to make a gram.

Measures	Large	Base	Small
Length	kilometre (km)	metre (m)	centimetre (cm) millimetre (mm)
Volume		litre (L)	millilitre (mL)
Mass	kilogram (kg)	gram (g)	milligram (mg)

Exercise Eleven

Write large, small or base on the line. Check your work using the answer key at the end of the exercise.

a) kilometre _____

b) millilitre _____

c) metre _____

d) gram _____

e) Litre _____

f) millimetre _____

g) milligram _____

h) kilogram _____

i) centimetre _____

Answers to Exercise Eleven

a) large b) small c) base d) base e) base f) small g) small
h) large i) small

Exercise Twelve

Write the base unit of measure and then the prefix if one is needed. Check your work using the answer key at the end of the exercise.

	Item	Base	Prefix (if needed)
a	Height of a tree		
b	A bottle of vanilla		
c	A cold tablet		
d	Distance between Vancouver and Toronto		
e	Thickness of a piece of paper		
f	Length of your foot		
g	Length of a piece of lumber		
h	A bottle of hand lotion		
i	A granola bar		
j	Diameter of a DVD		
k	Mass of a book		
l	Water in a hot tub		
m	Distance around the Earth		
n	Gap in a spark plug		

Answers to Exercise Twelve

	Item	Base	Prefix (if needed)
a	Height of a tree	*m*	
b	A bottle of vanilla	*L*	*milli*
c	A cold tablet	*g*	*milli*
d	Distance between Vancouver and Toronto	*m*	*kilo*
e	Thickness of a piece of paper	*m*	*milli*
f	Length of your foot	*m*	*centi*
g	Length of a piece of lumber	*m*	
h	A bottle of hand lotion	*L*	*milli*
i	A granola bar	*g*	
j	Diameter of a DVD	*m*	*centi*
k	Mass of a book	*g*	
l	Water in a hot tub	*L*	
m	Distance around the Earth	*m*	*kilo*
n	Gap in a spark plug	*m*	*milli*

Exercise Thirteen

Write the unit of measure you would use for each item below.
Check your work using the answer key at the end of the exercise.

	Item	Unit of Measure
a	***Coffee in a cup***	***millilitres (mL)***
b	Bag of potatoes	
c	Gas for a car	
d	Length of the hall	
e	Vitamin C tablet	
f	Thickness of glass	
g	Width of a page	
h	Box of cereal	
i	Distance from Vancouver to Halifax	
j	Height of a child	
k	Can of soup	
l	Window wash for the car	
m	Dose of heart medicine	
n	Length of a machine bolt	
o	Cheese	

Answers to Exercise Thirteen

a) mL b) kg c) L d) m e) mg f) mm g) cm
h) g i) km j) m k) mL l) L m) mg n) mm
o) kg

Area of Rectangles and Squares

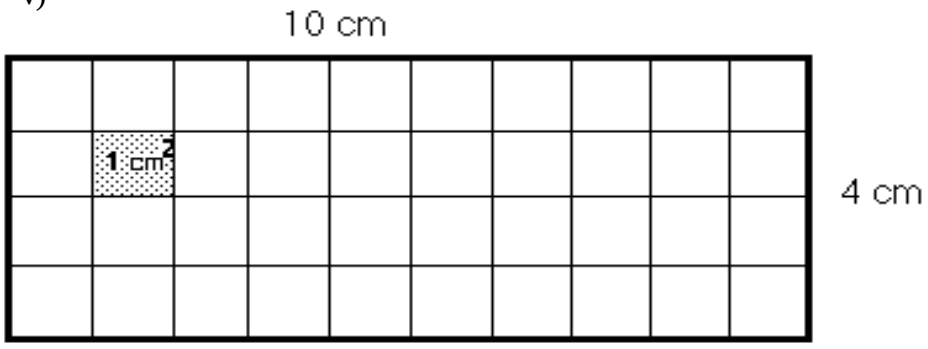
Area is the amount of surface within a figure. Area is described using *square units*.

For example,

- If the figure is a room, the **area** is the floor surface.
- If the figure is a tabletop, the area is the top surface of the table.
- If the figure is a roof, the area would be the shingled surface.
- If the figure is property, the area is the ground within the property lines.
- If the figure is this page, the area is the entire flat page that you are reading.

Example A: Find the area of this rectangle.

v)



The measurements of this rectangle are given in centimetres. To measure the area, we will use squares which are 1 cm by 1 cm (**a square centimetre**). How many square centimetres will fit on the surface of this rectangle? Count the 1 cm squares drawn within the Example A rectangle.

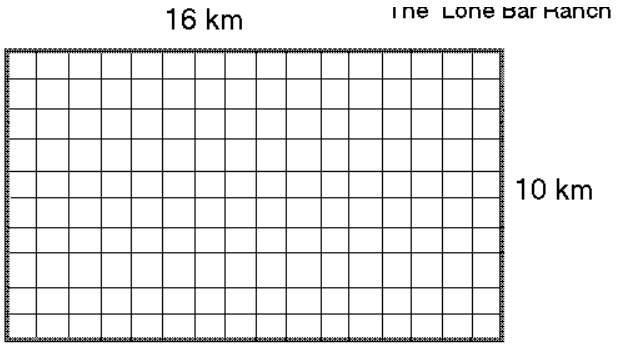
The area of this rectangle is _____ square centimetres.

This is written as ____ cm^2

Square centimetres is usually written **cm^2** which is said as "square centimetres" or "centimetres squared". The small number is called an *exponent* and if the exponent is 2, it means multiplied by itself, so cm^2 means cm × cm.

Square kilometres are written **km^2**. Square metres are written **m^2.**

Example B: This is a diagram of a large cattle ranch. The measurements of the ranch are shown as kilometres. What is the area of this ranch?



The square units to measure will be **square kilometres**. The area of this ranch will be the number of units 1 km by 1 km (km^2). The diagram shows how many square kilometres would fit in an area 16 km by 10 km. Count them. The area of the Lone Bar Ranch is ____ km^2.

Did you find a quick method for counting the square units? Did you multiply the number of rows by the number of square kilometres in each row? The quick method of finding the area of a rectangle is to multiply the length and the width.

Use this formula **to find the area of a rectangle:**

$$\mathbf{A_{rectangle} = l \times w}$$

Area of a rectangle = length (l) × width (w)
Length times width can also be expressed as *lw*,

so $\mathbf{A_{rectangle} = lw}$

The answer **must** be expressed in square units.

Example C: Give the area of a soccer field that is 100 m by 45 m.

$A_{rectangle} = lw$

Area of the soccer field = 100 m × 45 m = 4 500 $\mathbf{m^2}$

Exercise One

Find the area of the rectangles described below. The measures of the length (l) and the width (w) have been given. Draw and label a picture for each. Be sure to write the unit of measure for each answer. Check your work using the answer key at the end of the exercise.

a) $l = 10$ cm
$w = 6$ cm

b) $l = 100$ km
$w = 70$ km

c) $l = 400$ km
$w = 100$ km

d) $l = 975$ cm
$w = 35$ cm

e) l = 196 cm
$w = 28$ cm

f) $l = 82$ km
$w = 12$ km

g) $l = 60$ cm
$w = 250$ cm

h) $l = 90$ cm
$w = 2$ cm

Answers to Exercise One

a) 60 cm^2 b) 7 000 km^2 c) 40 000 km^2 d) 34 125 cm^2
e) 5 488 cm^2 f) 984 km^2 g) 15 000 cm^2 h) 180 cm^2

Squares are rectangles with all four sides congruent (the same length). So to find the area of a square you still use the same formula of multiplying the length times the width. But since the length and the width of a square are the same, you are multiplying the measure of the side (s) by itself. The formula for finding the area of a square is often written using an exponent.

$$\text{A square} = \mathbf{s^2}$$

For example, to find the area of a square piece of property, multiply the length of one side by itself. If the measure of one side of a property is 75 m,

Area of this piece of property: $75^2 = 75\text{m} \times 75\text{m} = 5\,625\ \text{m}^2$

Exercise Two

Find the area of the squares. The measure of the side has been given. Draw and label a picture for each. Be sure to write the unit of measure for each answer. Check your work using the answer key at the end of the exercise.

a) A_{square}, if $s = 5$ cm

b) A_{square}, if $s = 125$ km

c) A_{square}, if $s = 45$ mm

d) A_{square}, if $s = 100$ m

e) A_{square}, if s = 14 km

f) A_{square}, if s = 25 cm

Answers to Exercise Two

a) 25 cm^2 b) 15 625 km^2 c) 2 025 mm^2 d) 10 000 m^2

e) 196 km^2 f) 625 cm^2

Problems Using Area

Exercise Three

Do these problems by following the five problem solving steps. Be sure to draw a picture. Check your work using the answer key at the end of the exercise.

a) A garden in the shape of a rectangle is 34 m long and 20 m wide. What is the area of the garden?

b) Mr. Pavelski has a lot in the shape of a square. If the side of his square lot is 50 m, what is the area of the lot?

c) A rectangular board is 58 cm wide and 64 cm long. How much area will this board cover?

d) Kyoko bought some curtain material that is 198 cm long and 40 cm side. How many square centimetres of material did she buy

e) The distance between bases of a baseball diamond (a square) is 27 m. What is the area of the baseball diamond?

f) The janitor waxed the floor that was 24 m long and 18 m wide. How many square metres of floor did he wax?

g) The bulletin board in the hall is 66 cm long and 58 cm wide. What is the area of the bulletin board?

h) In the Canadian Football League (CFL) the field of play measures 101 m long by 59 m wide. What is the area of the football field?

i) The size of the ice surface for international hockey is 61 m long by 31 m wide. What is the area of the ice surface?

j) The size of a soccer pitch for international play is 105 m long and 68 m wide. What is the area of an international soccer field?

k) The base of the Eiffel Tower is a square whose side is 102 m long. What is the area of the base of the Eiffel Tower?

Answers to Exercise Three

a) 680 m^2	b) 2 500 m^2	c) 3 712 cm^2	d) 7 920 cm^2
e) 729 m^2	f) 432 m^2	g) 3 828 cm^2	h) 5 959 m^2
i) 1 891 m^2	j) 7 140 m^2	k) 10 404 m^2	

Perimeter and Area of Rectangles and Squares

Rectangle

Perimeter means **distance around**. To find the **perimeter** of a rectangle, use the formula

P = 2 x length + 2 x width.

Example A:

P = 2 x length + 2 x width

= 2 x 4 cm + 2 x 2 cm

= 8 cm + 4 cm

= 12 cm

Remember: Multiply first and then add.

Area means **the amount of surface within a shape**. To find the **area** of a rectangle, use the formula

A = length x width

Example A:

A = length x width

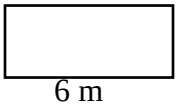
= 4 cm x 2 cm

= 8 cm^2

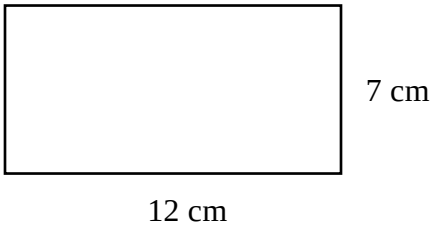
Exercise Four

For each rectangle, find both the perimeter (distance around) and the area (amount of surface within). Check your work using the answer key at the end of the exercise.

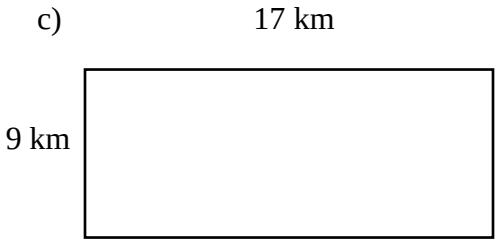
a)



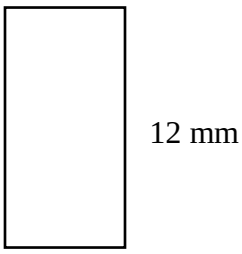
b)



c)

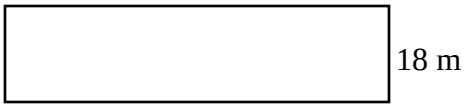


d)



e)

f)



g) Raoul's lot is shaped like a rectangle. If it is 55 m long and 15 m wide, what is the perimeter and area of his lot?

h) The playground is shaped like a rectangle. Its length is 140 m and its width is 60 m. What is the perimeter and area of the playground?

Answers to Exercise Four

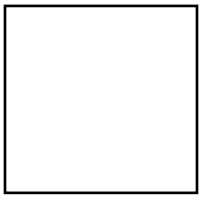
a) P = 16 m, A = 12 m^2
b) P = 38 cm, A = 84 cm^2
c) P = 52 km, A = 153 km^2
d) P = 40 mm, A = 96 mm^2
e) P = 94 m, A = 480 m^2
f) P= 166 m, A = 1 170 m^2
g) P = 134 m, A = 825 m^2
h) P = 400 m, A = 8 400 m^2

Square

Perimeter means **distance around**. To find the **perimeter** of a square, use the formula

$$\mathbf{P = 4 \times side} \text{ or } \mathbf{P_{square} = 4s}$$

Example A:



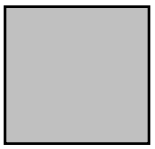
9 cm

$$\mathbf{P = 4 \times side}$$
$$\mathbf{= 4 \times 9\ cm}$$
$$\mathbf{= 36\ cm}$$

Area means **the amount of surface within a shape**. To find the **area** of a square, use the formula

$$\mathbf{A = side^2} \text{ or } \mathbf{A_{square} = s^2}$$

Example A:



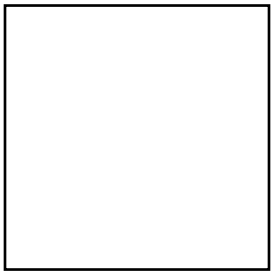
4 cm

$$\mathbf{A = side^2}$$
$$\mathbf{= (4\ cm)^2}$$
$$\mathbf{= 8\ cm^2}$$

Exercise Five

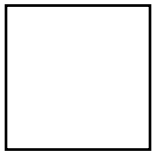
For each square, find both the perimeter (distance around) and the area (amount of surface within). Check your work using the answer key at the end of the exercise.

a)



5 m

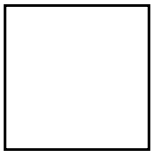
b)



9 cm

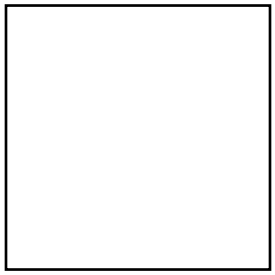
c)

15 cm



d)

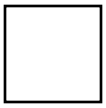
38 cm



e)

42 cm

f)



57 mm

g) Luisa bought a 115 cm square tablecloth. What is the perimeter and area of the tablecloth?

h) Mr. Liang bought a square tarp whose side was 31 m. What is the perimeter and area of the tarp?

Answers to Exercise Five

a) P = 20 m, A = 25 m^2 b) P = 36 m, A = 81 m^2 c) P = 60 cm, A = 225 cm^2

d) P = 152 cm, A = 1 444 cm^2 e) P = 168 cm, A = 1 764 cm^2 f) P = 228 mm, A = 3 249 mm^2

g) P = 460 cm, A = 13 225 cm^2 h) P = 124 m, A = 961 m^2

Topic D: Self-Test

Mark /32 **Aim 26/32**

A. For each item, circle the unit of measure you would use. **8 marks**

	Item	Unit of Measure			
a	Height of a doorknob above the floor	m	cm	mm	km
b	Thickness of a piece of wire	m	cm	mm	km
c	Length of a ski	m	cm	mm	km
d	Thickness of a piece of string	m	cm	mm	km
e	Height of a fence	m	cm	mm	km
f	Length of a finger	m	cm	mm	km
g	Length of a football field	m	cm	mm	km
h	How far you travelled on your holiday	m	cm	mm	km

B. Circle the letter of the most reasonable measure. **6 marks**

a) Storage bin
   a) 66 mL
   b) 66 L
   c) 6 L

b) Baby Shampoo
   a) 593 mL
   b) 593 L
   c) 59 L

c) Antifreeze
   a) 40 L
   b) 4 L
   c) 40 mL

d) Wastebasket
   a) 42 mL
   b) 4 L
   c) 42 mL

e) Deodorant
   a) 354 L
   b) 35 mL
   c) 354 mL

f) Liquid laundry soap
   a) 975 mL
   b) 97 L
   c) 975 L

C. Circle the unit of measure you would use. **6 marks**

	Item	Unit of Measure
a	Can of peanuts	mg g kg
b	Cat litter	mg g kg
c	An antacid tablet	mg g kg
d	Bag of potato chips	mg g kg

e) A fish
   a) 5 g
   b) 5 mg
   c) 5 kg

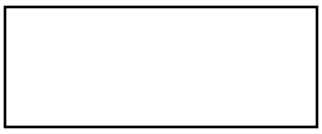
f) A bar of soap
   a) 90 mg
   b) 90 kg
   c) 90 g

D. Fill in the chart with the right metric prefix. **12 marks**

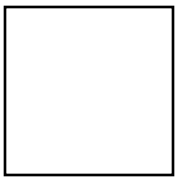
Small	Base	Large

E. Find the perimeter and area for each shape. **6 marks**

a)

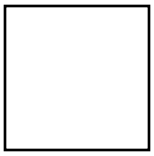


b)



c)

d)



e) A double size bed cover measures 135 cm wide and 190 cm long. What is the perimeter and area of the bed cover?

f) An Olympic size swimming is 50 m long and 25 m wide. What is the perimeter and area of the swimming pool?

Answers to Topic D Self-Test

A.

a) cm b) mm c) cm d) mm e) m or cm f) cm
g) m h) km

B.

a) b b) a c) a d) b e) c f) a

C.

a) g b) kg c) mg d) g e) c f) c

D.

Small	Base	Large
milli	Litre	kilo
centi	metre	
	gram	

E.

a) P = 20 cm, A = 21 cm^2 b) P = 24 km, A = 36 km^2 c) P = 410 m, A = 3 864 m^2
d) P = 348 mm, A = 7 569 mm^2 e) P = 650 cm, A = 25 650 cm^2 f) P = 150 m, A = 1 250 m^2

Unit 4 Review – Change, Time and the Metric System

You will now practice all the skills you learned in Unit 4. Check your work using the answer key at the end of the review

A. Circle the number of coins or bills you would need to get from the first number to the second number. Make sure to use the least number of coins or bills.

a) $48 to $50

b) $59 to $60

c) $73 to $80

d) $33 to $40

B. State the number and kind of coins and bills you would need to get from the first number to the second number. Make sure you use the least number of coins and bills as possible.

a) $23 to $25

b) $31 to $35

c) $85 to $90

d) $70 to $90

C. State the number and kind of coins and bills you would need to get from the first number to the second number. Make sure you use the least number of coins and bills as possible.

a) $37 to $50

Need	To get to

b) $53 to $60

Need	To get to

c) $77 to $100

Need	To get to

d) $21 to $50

Need	To get to

D. State the number and kind of coins and bills you would need to get change from $100. Make sure you use the least number of coins and bills as possible.

a) $63.54 to $80

Need	To get to

b) $32.63 to $50

Need	To get to

c) $20.31 to $40

Need	To get to

d) $72.18 to $100

Need	To get to

E. State the number and kind of coins and bills you would need to get change from $100. Make sure you use the least number of coins and bills as possible.

a)

printer for $78.36

b)

cordless phone for $55.65

a) Mrs. Kono bought a new cordless kettle for $44.78. How much change will Mrs. Kono get from $100?

F. Convert the time units and write the answers in the *simplest form*.

a) 4 800 s = _____ min

b) 1 460 d = _____ y

c) 692 min = _____h, _____min

d) 8 min, 192 s = _____min, _____s

e) 7d, 261 h = _____d, _____h

f) 11h, 452 min = _____h, ____min

g) 1 739 d = _____ y, _____ d

h) 101 h = _____d,_____h

G. Convert the time units and write the answers in the *simplest form*.

a) 15 h = _____ min

b) 12 d = _____ h

c) 22 min, 8 s = _____ s

d) 5 y, 193 d = _____ d

e) 3 d, 22 h = _____ h

f) 14 h, 15 min = _____ min

g) 36 min, 11 s = _____ s

h) 2 y, 251 d = _____ d

H. Add the times and write the answers in the *simplest form*. Check your work using the answer key at the end of the exercise.

a) 5 h, 32 min
+ 2 h, 45 min

b) 2 h, 15 min, 17 s
+ 1 h, 48 min, 53 s

I. Subtract these units of time and write the answers in the *simplest form*. Check your work using the answer key at the end of the exercise.

a) 5 h, 19 min
− 3 h, 45 min

b) 8 h, 19 min, 10 s
− 2 h, 41 min, 51 s

J. Multiply and write the answers in simplest form. Check your work using the answer key at the end of the exercise.

a) 3 min, 12 s
x 4

b) 2 h, 9 min, 36 s
x 5

c) It takes Alessandra 1 h, 42 min each day to commute to and from work. If Alessandra works 5 days a week, how long does she commute each week?

K. Circle the letter of the most reasonable measure.

a) Diameter of a hockey puck
   a) 76 mm
   b) 76 m
   c) 76 cm

b) Distance from the mall to home
   a) 10 km
   b) 10 m
   c) 10 cm

c) Thickness of a blanket
   a) 10 m
   b) 10 cm
   c) 10 mm

d) Height of a tree
   a) 28 mm
   b) 28 m
   c) 28 cm

L. Choose the most reasonable measure.

a) Carlos drinks
   a) 500 L of milk
   b) 500 mL of milk
   c) 5 mL of milk

b) A thermos holds
   a) 360 mL
   b) 360 L
   c) 36 L

c) A swimming pool holds 3 758 _____ of water.

d) A tube of lotion is 50 _____.

M. Choose the most reasonable measure.

a) A dog weighs
   a) 17 g
   b) 17 kg
   c) 17 mg

b) A nickel has mass of
   a) 5 g
   b) 5 mg
   c) 5 kg

c) A paper clip has mass of
   a) 1 kg
   b) 1 mg
   c) 1 g

d) Six math books have mass of
   a) 2 kg
   b) 2 mg
   c) 2 g

d) Elena took 400 _____of vitamin A.

e) Suki bought 10 _____ of potatoes.

N. Write the base unit of measure and then the prefix if one is needed.

	Item	Base	Prefix (if needed)
a	Length of a garden hose		
b	A bottle of olive oil		
c	A child's multivitamin		
d	Distance between Jupiter and Mars		
e	Thickness of a kleenex		

O. Write the unit of measure you would use for each item below.

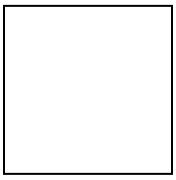
	Item	Unit of Measure
a	Paint thinner	
b	Cat litter	
c	Deodorant	
d	Length of the street	
e	Aspirin	

P. Find the area of each shape.

a) 37 m

16 m

b) 82 cm

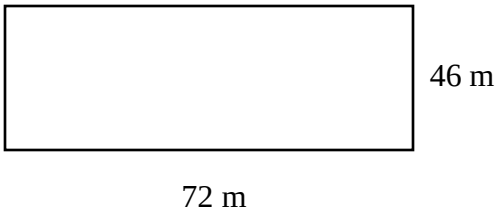


c) Red Square in Moscow measures 330 m long and 70 m wide. What is the area of Red Square?

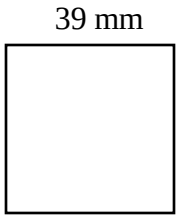
d) Yoshiro is going to build a square patio whose side is 23 m. What is the area of the patio?

Q. Find the perimeter and area of each shape.

a)



b)



c) Nadal wants to fence his garden. It is 15 m wide and 26 m long. How much fencing does Nadal need? How much space does Nadal have to plant a garden?

d) Yolanda would like to fencing and sod for her new lawn that is 54 m long and 42 m wide. How much fencing does she need? How much sod does she need?

Answers to Unit 4 Review

A.

a) 1 twonie b) 1 loonie c) 1 twonie, 1 - $5 d) 1 twonie, 1 - $5

B.

a) 1 twonie b) 2 twonies c) 1 - $5 d) 1 - $20

C.

a) $37 to $50

Need	To get to
1 loonie	$38
1 twonie	$40
1 - $10	$50

c) $77 to $100

Need	To get to
1 loonie	$78
1 twonie	$80
1 - $20	$100

b) $53 to $60

Need	To get to
1 twonie	$55
1 - $5	$60

d) $21 to $50

Need	To get to
2 twonies	$25
1 - $5	$30
1 - $20	$50

D.

a) $63.54 to $80

Need	To get to
1 penny	$63.55
2 dimes	$63.75
1 quarter	$64
1 loonie	$65
1 - $5	$70
1 - $10	$80

b) $32.63 to $50

Need	To get to
2 pennies	$32.65
1 dime	$32.75
1 quarter	$33
1 twonie	$35
1 - $5	$40
1 - $10	$50

c) $20.31 to $40

Need	To get to
4 pennies	$20.35
1 nickel	$20.40
1 dime	$20.50
2 quarters	$21
2 twonies	$25
1 - $5	$30
1 - $10	$40

d) $72.18 to $100

Need	To get to
2 pennies	$72.20
1 nickel	$72.25
3 quarters	$73
1 twonie	$75
1 - $5	$80
1 - $20	$100

E.

a) 4 pennies, 1 dime, 2 quarters, 1 loonie, 1 - $20

b) 1 dime, 1 quarter, 2 twonies, 2 - $20

c) 2 pennies, 2 dimes, 1 - $5, 1 - $10, 2 - $20

F.

a) 80 min b) 4 y c) 11 h, 32 min d) 11 min, 12 s

e) 17 d, 21 h f) 18 h, 32 min g) 4 y, 279 d h) 4 d, 5 h

G.

a) 900 min b) 288 h c) 1 328 s d) 2 018 d

e) 94 h f) 855 min g) 2 171 s h) 981 d

H.

a) 8 h, 17 min b) 4 h, 4 min, 10 s

I.

a) 1 h, 34 min, b) 5 h, 37 min, 19 s

J.

a) 12 min, 48s b) 10 h, 49 min, 0 s

K.

a) a b) a c) c d) b

L.

a) b b) a c) L d) mL

M.

a) b b) a c) c d) a e) mg f) kg

N.

	Item	Base	Prefix (if needed)
a	Length of a garden hose	***m***	
b	A bottle of olive oil	***L***	***m***
c	A child's multivitamin	***g***	***m***
d	Distance between Jupiter and Mars	***m***	***k***
e	Thickness of a kleenex	***m***	***m***

O.

a) L b) kg c) mL or mg d) m e) mg

P.

a) A = 592 m^2 b) A = 6 724 cm^2 c) 23 100 m^2 d) A = 529 m^2

Q.

a) P = 236 m, A = 3 312 m^2

b) P = 156 mm, A = 1 521 mm^2

c) P = 82 m, A = 390 m^2

d) P = 192 m, A = 2 268 m^2

CONGRATULATIONS!!

Now you have finished Unit 4.

TEST TIME!

Ask your instructor for the Practice Test for this unit.
Once you've done the practice test,
you need to do the unit test.
Again, ask your instructor for this.
Good luck!

Book 3 Review

You will now practice all the skills you learned in Book 3. Check your work using the answer key at the end of the review.

If you can't remember how to do a question, go back to the lesson on this topic to refresh your memory. The unit and topic for where each question came from is listed next to the question.

Example: **1-B** means Unit 1, Topic B

2-A

A. Find the products.

a) $\begin{array}{r} 4 \\ \times\ 9 \\ \hline \end{array}$ b) $\begin{array}{r} 7 \\ \times\ 8 \\ \hline \end{array}$ c) $\begin{array}{r} 2 \\ \times\ 6 \\ \hline \end{array}$

d) $\begin{array}{r} 9 \\ \times\ 5 \\ \hline \end{array}$ d) $\begin{array}{r} 6 \\ \times\ 10 \\ \hline \end{array}$ f) $\begin{array}{r} 0 \\ \times\ 3 \\ \hline \end{array}$

g) $\begin{array}{r} 8 \\ \times\ 4 \\ \hline \end{array}$ h) $\begin{array}{r} 5 \\ \times\ 2 \\ \hline \end{array}$ i) $\begin{array}{r} 10 \\ \times\ 10 \\ \hline \end{array}$

B. Find the products.

a) $\begin{array}{r} 71 \\ \times\ 3 \\ \hline \end{array}$ b) $\begin{array}{r} 623 \\ \times\ 3 \\ \hline \end{array}$

c) $\begin{array}{r} 8\,431 \\ \times\ 2 \\ \hline \end{array}$

d) $\begin{array}{r} 5\,231 \\ \times\ 3 \\ \hline \end{array}$

C. Find the products.

a) $\begin{array}{r} 68 \\ \times\ 5 \\ \hline \end{array}$

b) $\begin{array}{r} 457 \\ \times\ 6 \\ \hline \end{array}$

c) $\begin{array}{r} 9\,346 \\ \times\ 7 \\ \hline \end{array}$

d) $\begin{array}{r} 1\,329 \\ \times\ 4 \\ \hline \end{array}$

2-C

D. Find the products.

a) $\begin{array}{r} 45 \\ \times\ 26 \\ \hline \end{array}$

b) $\begin{array}{r} 542 \\ \times\ 38 \\ \hline \end{array}$

c) $\begin{array}{r} 3\,829 \\ \times\ 52 \\ \hline \end{array}$

d) $\begin{array}{r} 463 \\ \times\ 179 \\ \hline \end{array}$

e) $\begin{array}{r} 6\,314 \\ \times\ 231 \\ \hline \end{array}$

f) $\begin{array}{r} 1\,425 \\ \times\ 537 \\ \hline \end{array}$

E. Find the products. Use the shortcut.

a) $\begin{array}{r} 1\,000 \\ \times\ 792 \\ \hline \end{array}$

b) $\begin{array}{r} 9\,264 \\ \times\ 100 \\ \hline \end{array}$

c) $\begin{array}{r} 1\,000 \\ \times\ 85 \\ \hline \end{array}$

d) 3 609 x 10 =

e) 100 x 259 =

f) 10 x 46 =

g) 5 719 x 1 000 =

2-D

F. Find an estimated product.

a) $\begin{array}{r} 72 \\ \times\ 38 \\ \hline \end{array}$

b) $\begin{array}{r} 574 \\ \times\ 83 \\ \hline \end{array}$

c) $\begin{array}{r} 5\,492 \\ \times\ 87 \\ \hline \end{array}$

d) $\begin{array}{r} 792 \\ \times\ 901 \\ \hline \end{array}$

e) $\begin{array}{r} 8\,560 \\ \times\ 193 \\ \hline \end{array}$

f) $\begin{array}{r} 29\,492 \\ \times\ 585 \\ \hline \end{array}$

2-E

G. Word Problems.

a) The Great Belt Suspension Bridge in Denmark is 1 624 metres long. How many metres will 24 trucks travel crossing the bridge?

b) How many cans of peaches are needed to pack 300 boxes if each box has 3 rows and each row has 6 cans? (2 step question)

c) The Krubera Cave in Georgia is the deepest cave in the world at 2 191 metres. Estimate how many metres 348 visitors will cover going down to the cave.

3-A

H. Complete this chart.

	Multiplication	Division	Division	"Say"
a)	$3 \times 8 = 15$ $8 \times 3 = 15$	$24 \div 8 = 3$ $24 \div 3 = 8$	$8\overline{)24}$ (3) $3\overline{)24}$ (8)	*24 divided by 8 is 3* *24 divided by 3 is 8*
b)	$7 \times 5 = 35$			
c)	$9 \times 3 = 27$			

I. Give the answer.

a) $28 \div 4 =$ b) $18 \div 6 =$ c) $64 \div 8 =$

d) $9\overline{)81}$ e) $5\overline{)40}$ f) $3\overline{)21}$

J. Find the quotients.

a) $8\overline{)60}$ b) $5\overline{)49}$

c) $9\overline{)43}$ d) $3\overline{)19}$

3-B

K. From the list of numbers, write the numbers.

96, 345, 3 816, 6 815, 38 433, 95 373

a) Which numbers are divisible by 2?

b) Which numbers are divisible by 3?

c) Which numbers are divisible by 5?

d) Which numbers are divisible by 9?

3-C

L. Find the quotients.

a) $3\overline{)963}$ b) $2\overline{)682}$

c) $4\overline{)844}$

d) $5\overline{)550}$

M. Find the quotients.

a) $9\overline{)387}$

b) $6\overline{)492}$

c) $5\overline{)915}$

d) $7\overline{)469}$

N. Find the quotients.

a) $8\overline{)832}$

b) $4\overline{)836}$

c) $3\overline{)927}$

d) $2\overline{)416}$

O. Find the quotients. Check your answers using multiplication.

a) $5\overline{)92}$ b) $7\overline{)86}$

c) $4\overline{)73}$ d) $6\overline{)91}$

P. Find the quotients.

a) $3\overline{)851}$ b) $8\overline{)509}$

c) $2\overline{)407}$ d) $7\overline{)954}$

3-D

Q. Find the quotients.

a) $24\overline{)480}$ b) $58\overline{)928}$

c) $36\overline{)1\ 944}$

d) $73\overline{)37\ 668}$

R. Find the quotients.

a) $10\overline{)683}$

b) $1\ 000\overline{)41\ 839}$

c) $100\overline{)13\ 041}$

d) $1\ 000\overline{)63\ 125}$

S. Find the quotients.

a) $348\overline{)8\ 010}$

b) $483\overline{)27\ 150}$

c) $753\overline{)619\ 345}$

d) $73\overline{)37\ 668}$

3-E

T. Give an estimated quotient. Show your rounding where needed.

a) $30\overline{)63\,000}$

b) $7\,000\overline{)8\,400\,000}$

c) $58\overline{)2\,894}$

d) $438\overline{)23\,689}$

e) $768\overline{)63\,875}$

f) $896\overline{)80\,986}$

U. Word Problems.

a) A satellite orbits the moon every 58 minutes. How many complete orbits does it make 6 728 minutes?

b) If it takes 73 hours to make a snow blower. How many snow blowers can be made in 47 815 hours?

c) There were 10 780 tickets sold at the game. There were 150 tickets in each roll. How many complete rolls of tickets were used? How many were sold from the next roll?

V. Solve the cost per unit price.

a) 6 packages of rice for $12

b) 2 tubs of yogurt for $8

W. Solve the unit price and then underline the best buy.

a) Dog food
8 kilograms for $16
15 kilograms for $45

b) Movies
9 movies for $162
3 movies for $48

3-G

X. Word Problems.

a) A plane carrying 167 passengers flew 113 059 passenger kilometres. How many kilometres did each passenger fly?

b) A gorilla weighs 275 kilograms. A person weighs 91 kilograms. How much heavier is the gorilla?

c) The Pacific Leatherback Turtle weighs 704 kilograms. The Atlantic Leatherback Turtle weight 463 kilograms. The Green Sea Turtle weighs 392 kilograms. How much do these turtles weigh altogether?

4-B

X. Circle the number of coins or bills you would need to get from the first number to the second number. Make sure to use the least number of coins or bills.

a) $58 to $60

b) $41 to $50

e) $78 to $90

Y. State the number and kind of coins and bills you would need to get from the first number to the second number. Make sure you use the least number of coins and bills as possible.

e) $38 to $40

f) $21 to $40

g) $76 to $100

Z. State the number and kind of coins and bills you would need to get change from the second number. Make sure you use the least number of coins and bills as possible.

a) $43 to $100

Need	To get to

b) $23 to $80

Need	To get to

c) $58.37 to $100

Need	To get to

d) $62.71 to $100

Need	To get to

AA. State the number and kind of coins and bills you would need to get change from $100. Make sure you use the least number of coins and bills as possible.

a)

bread maker for $61.59

b)

shop vacuum cleaner for $84.43

c) Mrs. Chui bought building blocks for $33.44. How much change will she get from $100?

4-C

BB. Convert the time units and write the answers in the *simplest form*.

a) 144 h = _____ d

b) 6 000 s = _____ min

c) 260 min = _____h, _____min

d 2 169 d = _____y, _____d

e) 3 d, 56 h = _____d, _____h

f) 911 h = _____d, ____h

CC. Convert the time units and write the answers in the *simplest form*.

a) 5 d = _____ h

b) 3 h, 30 min = _____ min

c) 5 y, 10 d = _____ d

d) 4 min, 12 s = _____ s

e) 5 d, 6 h = _____ h

f) 2 h, 45 min = _____ min

DD. Add the times and write the answers in the *simplest form*.

a) $\begin{array}{r} 5\,\text{h},\ 42\,\text{min} \\ +\ 2\,\text{h},\ 35\,\text{min} \\ \hline \end{array}$

b) $\begin{array}{r} 3\,\text{h},\ 21\,\text{min},\ 49\,\text{s} \\ +\ 2\,\text{h},\ 56\,\text{min},\ 32\,\text{s} \\ \hline \end{array}$

EE. Subtract these units of time and write the answers in the *simplest form*.

a) $\begin{array}{r} 8\,\text{h},\ 19\,\text{min} \\ -\ 5\,\text{h},\ 47\,\text{min} \\ \hline \end{array}$

b) $\begin{array}{r} 15\,\text{h},\ 08\,\text{min},\ 27\,\text{s} \\ -\ \ 7\,\text{h},\ 17\,\text{min},\ 39\,\text{s} \\ \hline \end{array}$

FF. Multiply and write the answers in simplest form. Check your work using the answer key at the end of the exercise.

a) $\begin{array}{r} 8\,\text{min},12\,\text{s} \\ \times\ \ 4 \\ \hline \end{array}$

b) $\begin{array}{r} 4\,\text{h},36\,\text{min},49\,\text{s} \\ \times\ 5 \\ \hline \end{array}$

4-D

GG. Circle the letter of the most reasonable measure.

a) Depth of the ocean
   a) 3 926 mm
   b) 3 926 km
   c) 3 926 m

b) Thickness of string
   a) 5 mm
   b) 5 cm
   c) 5 m

c) Distance from the earth to moon
   a) 3 476 m
   b) 3 476 mm
   c) 3 476 km

d) Length of a banana
   a) 15 km
   b) 15 mm
   c) 15 cm

HH. Choose the most reasonable measure.

a) A spoonful of medicine
   a) 5 L
   b) 5 mL
   c) 50 mL

b) A bottle of orange juice
   a) 4 mL
   b) 4 L
   c) 40 L

c) A tube of toothpaste holds 130 _____.

d) The gas tank of a car holds 70 _____.

II. Choose the most reasonable measure.

a) A sugar cube has mass of
   a) 1 g
   b) 10 g
   c) 10 kg

b) A cat weighs
   a) 7 mg
   b) 7 kg
   c) 7 g

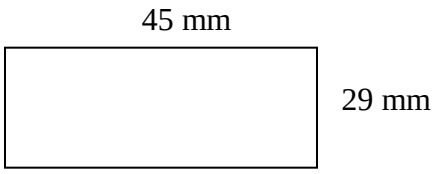
c) A headache pill has 375 _____ of medicine.

JJ. Write the base unit of measure and then the prefix if one is needed.

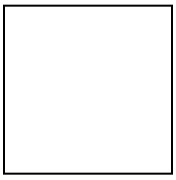
	Item	Base	Prefix (if needed)
a	Thickness of a rope		
b	Water in a bathtub		
c	A bag of rice		
d	Length of a table		

KK. Find the area of each shape.

a)



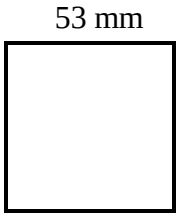
b)



LL. Find the perimeter and area of each shape.

a)

b)



c) Tiananmen Square measures 880 metres by 500 metres Find the perimeter and area of Tiananmen Square.

d) Andrèe wants to build a square patio whose side is 13 m. Find the perimeter and area of her new patio.

Answers to Book 3 Review

A.

a) 36 b) 56 c) 12 d) 45 e) 60
f) 0 g) 32 h) 10 i) 100

B.

a) 213 b) 1 869 c) 16 862 d) 15 693

C.

a) 340 b) 2 742 c) 65 422 d) 5 316

D.

a) 1 170 b) 20 596 c) 199 108 d) 82 698
e) 1 458 534 f) 765 225

E.

a) 792 000 b) 926 400 c) 85 000 d) 36 090
e) 25 900 f) 460 g) 5 719 000

F.

a) 70 x 40 = 2 800 b) 600 x 80 = 48 000
c) 5 000 x 90 = 450 000 d) 800 x 900 = 720 000
e) 9 000 x 200 = 1 800 000 f) 30 000 x 600 = 18 000 000

G.

a) 38 976 metres b) 5 400 cans c) 600 000 metres

H.

	Multiplication	**Division**	**Division**	**"Say"**
a)	*3 × 8 = 15*	*24 ÷ 8 = 3*	$8\overline{)24}$	*24 divided by 8 is 3*
	8 × 3 = 15	*24 ÷ 3 = 8*	$3\overline{)24}$	*24 divided by 3 is 8*
b)	7 × 5 = 35	**35 ÷ 5 = 7**	$5\overline{)35}$	35 divided by 5 is 7
	5 x 7 = 35	**35 ÷ 7 = 5**	$7\overline{)35}$	35 divided by 7 is 5
c)	9 × 3 = 27	**27 ÷ 3 = 9**	$3\overline{)27}$	27 divided by 3 is 9
	3 x 9 = 27	**27 ÷ 9 = 3**	$9\overline{)27}$	27 divided by 9 is 3

I.

a) 6 b) 3 c) 8 d) 9 e) 8 f) 7

J.

a) 7 R4 b) 9 R4 c) 4 R7 d) 6 R1

K.

a) 96, 3 816 b) 96, 345, 3 816, 38 433, 95 373 c) 345, 6 815
d) 3 816, 95 373

L.

a) 324 b) 341 c) 211 d) 110

M.

a) 43 b) 82 c) 183 d) 67

N.

a) 104 b) 209 c) 309 d) 208

O.

a) 18 R2 b) 12 R2 c) 18 R1 d) 16 R1

P.

a) 283 R2 b) 63 R5 c) 203 R1 d) 136 R2

Q.

a) 20 b) 16 c) 54 d) 516

R.

a) 68 R3 b) 418 R39 c) 130 R41 d) 63 R125

S.

a) 23 R6 b) 56 R102 c) 822 R379 d) 516

T.

a) 2 100 b) 1 200 c) 30 000 ÷ 60 = 50
d) 24 000 ÷ 400 = 60 e) 64 000 ÷ 80 = 800 f) 81 000 ÷ 900 = 90

U.

a) 116 orbits b) 655 snow blowers c) 71 full rolls, 130 tickets

V.

a) $2 b) $4

W.

a) $2, $3, 8 kilograms for $16 b) $18, $16, 3 movies for $48

X.

a) 1 twonie b) 2 twonies, 1 - $5 c) 1 twonie, 1 - $10

Y.

a) 1 twonie b) 2 twonies, 1 - $5, 1 - $10, c) 2 twonies, 1 - $20 d

Z. a) $43 to $100

Need	To get to
1 twonie	$45
1 - $5	$50
1 - $10	$60
2 - $20	$100

a) $23 to $80

Need	To get to
1 twonie	$25
1 - $5	$30
1 - $10	$40
2 - $20	$80

b) $58.37 to $100

Need	To get to
3 pennies	$58.40
1 dime	$58.50
2 quarters	$59.00
1 loonie	$60.00
2 - $20	$100.00

b) $62.71 to $100

Need	To get to
4 pennies	$62.75
1 quarter	$63.00
1 twonie	$65.00
1 - $5	$70.00
1 - $10	$80.00
1 - $20	$100.00

AA.

a) 1 penny, 1 nickel, 1 dime, 1 quarter, 1 loonie, 1 twonie, 1 - $5, 1 - $10, 1 - $20

b) 2 pennies, 1 nickel, 2 quarters, 1 - $5, 1 - $10

c) 1 penny, 1 nickel, 2 quarters, 1 loonie, 1 - $5, 3 - $20

BB.

a) 6 d b) 100 min c) 4 h, 20 min d) 5 y, 344 d

e) 5 d, 8 h f) 37 d, 23 h

CC.

a) 120 h b) 210 min c) 1 835 d d) 252 s

e) 126 h f) 165 min

DD.

a) 8 h, 07 min b) 6 h, 18 min, 21 s

EE.

a) 2 h, 32 min b) 7 h, 50 min, 48 s

FF.

a) 32 min, 48 s b) 23 h, 04 min, 05 s

GG.

a) c b) a c) c d) c

HH.

a) b b) b c) mL d) L

II.

a) a b) b c) mg

JJ.

	Item	Base	Prefix (if needed)
a	Thickness of a rope	m	m
b	Water in a bathtub	L	
c	A bag of rice	g	k
d	Length of a table	m	c

KK.

a) 1 305 mm^2 b) 2 916 cm^2

LL.

a) P = 294 m, A = 5 330 m^2 b) P = 212 mm, A = 2 809 mm^2

c) P = 2 760 m, A = 440 000 m^2 d) P = 54 m, A = 169 m^2

CONGRATULATIONS!!

Now you have finished Book 3.

TEST TIME!

Ask your instructor for the Practice Test for this book.
Once you've done the practice test,
you need to do the end test.
Again, ask your instructor for this.
Good luck!

Glossary

addends The numbers to be added together in an addition question. In 3 + 5 = 8, the addends are 3 and 5.

axis Any straight line used for measuring or as a reference.

balance Balance has many meanings. In money matters, the balance is the amount left. It might be the amount left in a bank account (bank balance) or it might be the amount you still must pay on a bill (balance owing).

cancelled cheque A cheque that has been cashed. The cheque is stamped, or cancelled, so it is no longer negotiable.

circumference The distance around a circle; the perimeter of a circle.

commission Salespeople may be paid a percentage of the money made in sales. The commission is part or all their earnings.

common fractions eg, $\frac{2}{3}, \frac{3}{7}, \frac{49}{50}$

cross multiply In a proportion, multiply the numerator of the first fraction times the denominator of the second fraction. Then multiply the denominator of the first fraction times the numerator of the second fraction. In a true proportion, the products of the cross multiplication are equal.

denominator The bottom number in a common fraction; tells into how many equal parts the whole thing has been divided.

diameter The distance across a circle through its centre.

difference The result of a subtraction question, the answer. Subtraction gives the difference between two numbers.

digit Any of the ten numerals (0 to 9) are digits. This term comes from our ten fingers which are called digits. The numerals came to be called "digits" from the practice of counting on the fingers!

discount An amount taken off the regular cost. If something is bought "at a discount" it is bought at less than the regular price.

divide To separate into equal parts.

dividend The number or quantity to be divided; what you start with before you divide.

divisor The number of groups or the quantity into which a number (the dividend) is to be separated.

equal = The same as

equation A mathematical statement that two quantities are equal. An equation may use numerals with a letter to stand for an unknown quantity. $6 + Y = 9$

equivalent Equal in value; equivalent numbers (whole or fractions) can be used interchangeably; that is, they can be used instead of each other.

estimate Make an approximate answer. Use the sign $\approx$ to mean approximately equal.

factors The numbers or quantities that are multiplied together to form a given product. $5 \times 2 = 10$, so 5 and 2 are factors of 10.

fraction Part of the whole; a quantity less than one unit.

horizontal in a flat position; we are horizontal when we lie in a bed. A horizontal line goes across the page.

improper fraction A common fraction with a value equal to or more than one.

infinite Without end, without limit.

invert To turn upside down.

like fractions With the same denominators.

lowest terms When the terms of a common fraction or ratio do not have a common factor (except 1), the fraction or ratio are in lowest terms (also called simplest form).

minuend The first number in a subtraction question.

mixed number A whole number and a common fraction. $1\frac{3}{4}$

mixed decimal A whole number and a decimal fraction. 1.75

multiple If a certain number is multiplied by another number, the product is a multiple of the numbers. Think of the multiplication tables. For example, 2, 4, 6, 8, 10, 12, 14...are multiples of 2.

multiplicand The number to be multiplied.

multiplier The number you multiply by.

negotiable Something which can be cashed, that is, exchanged or traded as money.

numbers Numbers represent the amount, the place in a sequence; *number* is the idea of quantity or order.

numerals The digits 1,2,3,4,5,6,7,8,9,0 are also called numerals. These ten digits are combined to make infinite numerals. Digits are like the letters, numerals are like the words and numbers are the meaning.

numerator The top number in a common fraction; the numerator tells how many parts of the whole thing are being considered.

overdrawn If the value of the cheques or money taken from a bank account is higher than the amount of money in the account, then the account is overdrawn. The account is "in the hole" or "in the red" are expressions sometimes used.

parallel Two objects or lines side by side, never crossing and always the same distance from each other. Railway tracks are parallel, the lines on writing paper are parallel.

percent % For every one hundred.

perimeter The distance around the outside of a shape.

place value We understand numbers by the way the digits (numerals) are arranged in relationship to each other and to the decimal point. Each position has a certain value. Our number system is a **decimal system**. The place value is based on **ten.**

prime number A number that can only be divided evenly by itself and 1.

product The result of a multiplying question, the answer.

proper fraction A common fraction with a value less than one.

proportion Generally, proportion is a way of comparing a part of something to the whole thing. Eg. his feet are small in proportion to his height. In mathematics, proportion is used to describe two or more ratios that are equivalent to each other.

quotient The result of a division question; the quotient tells how many times one number is contained in the other.

radius The distance from the centre of a circle to the outside of the circle.

ratio The relationship between two or more quantities. Eg. the ratio of men to women in the armed forces is 10 to 3 (10:3)

reciprocal A number, when multiplied by its reciprocal, equals 1. To find the reciprocal of a common fraction, invert it. $\frac{3}{5} \times \frac{5}{3} = 1$

reduce Write a common fraction in lowest terms. Divide both terms by same factor.

remainder The amount left when a divisor does not divide evenly into the dividend. The remainder must be less than the divisor.

sign In mathematics, a symbol that tells what operation is to be performed or what the relationship is between the numbers.

- \+ plus, means to add
- \- minus, means to subtract

× multiplied by, "times"

÷ divided by, division

= equal, the same quantity as

≠ not equal

≈ approximately equal

< less than

> greater than

≤ less than or equal to

≥ greater than or equal to

simplify See *reduce*.

subtrahend The amount that is taken away in a subtraction question.

sum The result of an addition question, the answer to an addition question.

symbol A written or printed mark, letter, abbreviation etc. that stands for something else.

term a) A definite period of time, such as a school term or the term of a loan.

b) Conditions of a contract; the terms of the agreement. c) In mathematics, the quantities in a fraction and in a ratio are called the *terms* of the fraction or the *terms* of the ratio. In an algebra equation, the quantities connected by a + or - sign are also called terms.

total The amount altogether.

transaction One piece of business. A transaction often involves money. When you pay a bill, take money from the bank or write a cheque, you have made a transaction.

unit Any fixed quantity, amount, distance or measure that is used as a standard. In mathematics, always identify the unit with which you are working. Eg. 3 km, 4 cups, 12 people, $76, 70 books, 545 g

unit price The price for a set amount. Eg. price per litre, price per gram.

unlike fractions Fractions which have different denominators.

vertical in an up and down position; we are vertical when we are standing up. On a page, a vertical line is shown from the top to the bottom of the page.