## Unit 4 Dividing Decimals

## Topic A: Dividing Decimals

Dividing decimals uses the same method that you learned for dividing whole numbers.

Vocabulary Review - Write the definitions.
Divisor:
$\qquad$
$\qquad$

Dividend:
$\qquad$
$\qquad$

Quotient:
$\qquad$
$\qquad$

| divisor $\longdiv { \text { dividend } }$ <br> dividend $\div$ divisor $=$ |  |
| :---: | :---: |
|  |  |
|  |  |

Be very sure that you hold the places in the quotient with a zero if there is no other digit

\[

\]

## Where do you place the decimal point?

Estimation is one method of locating the decimal point. Estimate the quotient using rounded whole numbers.

Example A: $\quad 18.6 \div 6 \approx 18 \div 6=3$

So you know the answer will be around 3 which is one whole number place. It will not be 0.3 and it will not be 30 .

When you actually divide 18.6 by 6 , the numerals in the quotient are 32 and your estimate of 3 tells you the decimal point will be after the 3 .

$$
18.6 \div 3=3.2
$$

Example B: $\quad 137.84 \div 18 \approx 140 \div 20=7$
The answer will be around 7. It will not be 0.7 or 70 or 700 .

The numerals in the quotient when you actually divide 137.84 by 18 are 766 .
You know from your estimate that the answer is approximately 7, which is one whole number place.

$$
137.84 \div 18=7.66
$$

$\stackrel{\rightharpoonup}{\square}$
To check the accuracy of your division, multiply the quotient by the divisor.

Dividend $\div$ divisor $=$ quotient
Quotient $\times$ divisor $=$ dividend

The product will equal the dividend if your arithmetic is correct.

$$
23.72 \div 8=2.965 \quad \begin{array}{r}
2.965 \\
\times \quad 8 \\
\hline 23.720
\end{array}
$$

Exercise One
The division has been done. Your task is to put the decimal point in the quotient by doing a whole number estimate of the question.
a) $\quad \begin{gathered}10.8 \\ 2 \longdiv { 2 1 . 6 }\end{gathered}\binom{10}{2 \longdiv { 2 0 }}$
b) $\quad 8 \longdiv { 1 . 3 } \quad ( \begin{array} { r } { 1 } \\ { 8 \longdiv { 1 0 . 4 } } \end{array} )$
c) $\quad \begin{array}{r}243 \\ \hline 14.16\end{array}$
d) $\begin{array}{r}82 \\ 7 \longdiv { 5 7 . 4 }\end{array}$
e) $\begin{array}{r}434 \\ \hline 173.6\end{array}$
f) $\quad 5 \longdiv { 3 4 5 }$
g) $\begin{array}{r}312 \\ 6 \longdiv { 1 8 . 7 2 }\end{array}$
h) $\quad 2 \longdiv { 2 4 8 }$
i) $\quad 3 \longdiv { 2 7 6 }$
j) $\quad \begin{array}{r}864 \\ 60.48\end{array}$
k) $\quad 6 \longdiv { 1 8 2 }$

1) $\begin{array}{r}3369 \\ 2 \longdiv { 6 . 7 3 8 }\end{array}$
m)
78
$3 \longdiv { 2 3 . 4 }$
n) $\begin{array}{r}936 \\ 7 \longdiv { 6 5 . 5 2 }\end{array}$
o) $\quad \begin{array}{r}393 \\ 7.86\end{array}$
p) $\quad \begin{array}{r}18 \\ 3 7 \longdiv { 6 6 . 6 }\end{array}$
q) $\quad \begin{array}{r}243 \\ 1 8 \longdiv { 4 3 . 7 4 }\end{array}$
r) $\begin{array}{r}43 \\ 2 1 \longdiv { 9 0 . 3 }\end{array}$

## Answers to Exercise One

a) 10.8
b) 1.3
c) 2.43
d) 8.2
e) 43.4
f) 3.45
g) 3.12
h) 2.48
i) 2.76
ј) 8.64
k) 1.82
l) 3.369
m) 7.8
n) 9.36
o) 3.93
p) 1.8
q) 2.43
r) 4.3

## Have you found the shortcut?

If the divisor is a whole number, place the decimal point in the quotient this way:
Put the decimal point in the quotient right above the decimal point in the dividend and then divide as you would whole numbers. It might be helpful to make a dotted line through the decimal points to keep the whole numbers and the fractions separated and in straight columns.

Example A: $18.45 \div 9=$

2.05
$9 \longdiv { 1 8 . 4 5 }$
$\frac{18}{} \begin{array}{r} \\ 0 \\ 4 \\ 0 \\ 45 \\ \frac{45}{0}\end{array}$

Example B: $420.75 \div 25=$


Exercise Two
a) $6 0 \longdiv { 0 . 2 4 } \begin{array} { r } { 1 4 . 4 0 } \\ { \text { check } } \\ { 0 . 2 4 } \end{array}$
$\underline{120} \downarrow$
240
$\times 60$
$\times 14.40$
240
c) $3 3 \longdiv { 7 . 2 6 }$
d) $1 4 \longdiv { 1 7 2 . 2 }$
e) $9 1 \longdiv { 2 6 3 . 9 }$
f) $2 5 \longdiv { 2 0 7 . 5 }$
g) $8 6 \longdiv { 9 . 4 6 }$
h) $7 5 \longdiv { 1 1 . 7 0 0 }$
i) $5 7 \longdiv { 9 6 . 9 }$
j) $6 3 \longdiv { 1 7 6 . 4 }$

## Answers to Exercise Two

a) 0.24
b) 0.56
c) 0.22
d) 12.3
e) 2.9
f) 8.3
g) 0.11
h) 0.156
i) 1.7
j) 2.8

## Dividing by Decimal Divisors

A decimal divisor must be changed to a whole number before you can work with it.
The method you will learn uses the following facts:

- Multiplying by 10,100 or 1000 etc. moves the decimal point as many places to the right as there are zeros in the $10,100,1000$.
- When the divisor and dividend are both multiplied by the same number, the quotient is not changed.
 Your instructor will give you more information about why this method works if you wish to know.

If the divisor is a decimal, do this:

- Set the question up for long division. (This may already be done.)

$$
\begin{aligned}
& 1.255 \div 0.05=\square \\
& 0 . 0 5 \longdiv { 1 . 2 5 5 }
\end{aligned}
$$

- Move the decimal point in the divisor as many places to the right as needed to make a whole number.

(moved decimal point 2 places which is like multiplying by 100)
- Now move the decimal point in the dividend the same number of places to the right (like multiplying by 100).

$$
0.05 . \longdiv { 1 . 2 5 . 5 }
$$

- Put the decimal point in the quotient directly above the new place in the dividend and divide.

$$
\text { 0.05. } \begin{gathered}
\frac{25.1}{1.25 .5}
\end{gathered}
$$

$$
1.255 \div 0.05=25.1
$$

- Zeros may have to be put at the end of the dividend when you move the decimal point.

$$
\begin{aligned}
& 48.6 \div 0.24=\square \\
& 0.24 \cdot \sqrt{48.60 .5}
\end{aligned}
$$

Remember that if the dividend is a whole number, first put a decimal to the right of it, and then move the decimal as needed to match what you did to the divisor. You will need to add zeros to hold the places.

$$
3 6 \div 1 . 8 = \square \quad 1 . 8 \longdiv { 3 6 }
$$



## Exercise Three

Find the quotients.
a) $1 . 3 \longdiv { 2 . 7 3 }$
b) $2 . 1 \longdiv { 0 . 6 5 1 }$
c) $3 . 4 \longdiv { 3 . 8 0 8 }$
d) $6 . 6 \longdiv { 1 9 . 1 4 }$
e) $5 . 5 \longdiv { 2 6 4 }$
f) $4 . 8 \longdiv { 1 7 6 . 1 6 }$
g) $0 . 0 4 \longdiv { 1 5 . 2 }$
h) $0 . 6 7 \longdiv { 6 . 1 6 4 }$

## Answers to Exercise Three

a) 2.1
b) 0.31
c) 1.12
d) 2.9
e) 48
f) 36.7
g) 380
h) 9.2

If you are having any difficulty with this exercise, ask your instructor for help before you go any further.

## Exercise Four

Now try these:
a) $0 . 5 \longdiv { 0 . 2 6 3 5 }$
b) $1 . 7 \longdiv { 1 5 . 4 7 }$
c) $0 . 0 4 \longdiv { 1 0 . 8 }$
d) $0 . 6 \longdiv { 2 4 3 }$
e) $0 . 0 0 3 \longdiv { 4 2 . 1 2 }$
f) $0 . 3 3 \longdiv { 0 . 1 4 5 2 }$
g) $4 . 9 \longdiv { 3 0 . 8 7 }$
h) $0 . 9 \longdiv { 1 2 . 3 3 }$

## Answers to Exercise Four

a) 0.527
b) 9.1
c) 270
d) 405
e) 14040
f) 0.44
g) 6.3
h) 13.7

## Exercise Five

a) $0.2448 \div 0.008=$

c) $25.6 \div 0.008=$
d) $2.176 \div 3.4=$
e) $378 \div 0.9=$
f) $0.946 \div 0.022=$
g) $205 \div 4.1=$
h) $2.1122 \div 59=$
i) $125 \div 0.005=$
j) $604.8 \div 0.007=$

## Answers to Exercise Five

a) 30.6
b) 3.902
c) 3200
d) 0.64
e) 420
f) 43
g) 50
h) 0.0358
i) 25000
j) 86400

## What about Remainders?

The questions that you have been practising all work out evenly. But, as you know, the world is seldom perfect and division questions seldom "come out even"! For everyday uses of mathematics, answers to the hundredths or thousandths decimal places are accurate enough. This is what you do if the division problem does not work out evenly:

- Do the long division until you have worked out three or four decimal places in your quotient. Add zeros to the decimal in the dividend as necessary.

- Round the quotient to the nearest tenth, hundredth, or thousandth as you are asked or as you need for your own use. Review Rounding if you need to.
$\underset{\square}{ }$ In this course, round to the nearest thousandth unless you are asked otherwise.
- In Example A, the quotient 1.7857 will round this way:
to the nearest thousandth
1.786
to the nearest hundredth
1.79
to the nearest tenth
1.8

In Example B, the quotient 248.2352 will round this way:

| to the nearest thousandth | 248.235 |
| :--- | :--- |
| to the nearest hundredth | 248.24 |
| to the nearest tenth | 248.2 |

- When you are planning to round the quotient, do the long division only to one decimal place past where you will round. It is not necessary to divide any further.
- If rounding the quotient to the nearest tenths, divide to the hundredths place ( 2 decimal places).
- If rounding the quotient to the nearest hundredths, divide to the thousandths place (3 decimal places).
- If rounding the quotient to the nearest thousandths, divide to the ten-thousandths place (4 decimal places).
- Always round money to the nearest cent.
$\$ 47.26 \div 3=\square$

| \$15.753 |
| :---: |
| 3) $\$ 47.260$ |
| $3^{\downarrow}{ }^{1}$ |
| 17 |
| $\underline{15}$ |
| 22 |
| 21 |
| 16 |
| 15 |
|  |

$\$ 15.753 \approx \$ 15.75$

- Sometimes numbers repeat when you divide.

$$
\begin{aligned}
& 100 \div 3= \\
& 33.333 \\
& 3 \longdiv { 1 0 0 . 0 0 0 }
\end{aligned}
$$

This will go on forever-to infinity.

To show that the 3 keeps repeating as a decimal fraction, put a $\cdot$ (dot) or $\mathrm{a}^{-}$(bar) above the repeating decimal digit.

$$
33 . \dot{3} \text { or } 33 . \overline{3}
$$

Sometimes a group of digits will repeat. Put a bar above the repeating decimal digits. For example 2.341341341341
$2 . \overline{341}$

## Exercise Six

Use long division to find the quotient. Round the quotient to the nearest tenth.
a) $13.71 \div 3=$
b) $71.13 \div 12=$
c) $6.17 \div 7=$
d) $2.61 \div 5=$
e) $7.359 \div 1.3=$
f) $15.68 \div 2.2=$
g) $4.93 \div 6=$
h) $59 \div 8=$

## Answers to Exercise Six

a) 4.6
b) 5.9
c) 0.9
d) 0.5
e) 5.7
f) 7.1
g) 0.8
h) 7.4
a) $41.874 \div 5=$
b) $22.76 \div 7=$
c) $98.9 \div 0.3=$
d) $52.48 \div 6=$
e) $43.893 \div 1.1=$
f) $1.9525 \div 0.6=$
g) $0.4474 \div 0.7=$
h) $10.48 \div 1.5=$

Answers to Exercise Seven
a) 8.37
b) 3.25
c) 329.67
d) 8.75
e) 39.90
f) 3.25
g) 0.64
h) 6.99

## Dividing by 10, 100, 1000,10 000, etc.

Multiplication and division are opposite operations. Multiplying by ten, hundred, etc. moves the decimal point the same number of decimal places to the right as there are zeros in the 10 , 100,1000 , etc. Moving a decimal point to the right gives a larger number.

So dividing by ten, hundred, etc. must move the decimal point to the left. Remember that moving a decimal point to the left gives a smaller number. Study the examples.

$$
\begin{aligned}
& 4.6 \div 10=4.6=0.46 \\
& 29.6 \div 10=2 \quad 9.6=2.96 \\
& 27.4 \div 100=27.4=0.274 \\
& 185.4 \div 100=1 \underset{\sim}{8} 5.4=1.854 \\
& 325 \div 1000=325 . \div 1000=325=0.325 \\
& 2567.3 \div 1000=256 \underset{\sim}{6} .3=2.5673
\end{aligned}
$$

To divide by a $10,100,1000,10000$, etc., move the decimal point the same number of places to the left as there are zeros in the divisor.

You may need to prefix zeros. Look at these examples:

$$
\begin{aligned}
& 0.3 \div 10=0.3=0.03 \\
& 1.75 \div 100=0.75=0.0175 \\
& 0.5 \div 1000=0.5000
\end{aligned}
$$

## Exercise Eight

a) $7 \div 10=$ $\qquad$
h) $2374.5 \div 1000=$
g) $183.75 \div 1000=$ $\qquad$
i) $0.63 \div 10=$ $\qquad$ j) $7.46 \div 100=$
k) $0.035 \div 10=$ $\qquad$ 1) $366 \div 100=$
n) $0.03 \div 10=$
m) $42.16 \div 1000=$
$\longrightarrow$
o) $923.5 \div 100=$ $\qquad$ p) $3980 \div 1000=$
r) $0.47 \div 100=$
q) $0.3 \div 10=$ $\qquad$
t) $6.9 \div 100=$
s) $28.1 \div 1000=$ $\qquad$
u) $0.1 \div 1000=$ $\qquad$ v) $100.1 \div 10=$
w) $16.2 \div 100=$ $\qquad$ x) $5692.1 \div 10=$
z) $3.31 \div 10=$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
b) $14 \div 100=$
d) $74.35 \div 10=$
f) $147.6 \div 100=$

Write the quotient. Use the short method you have just learned.
$\qquad$
$\qquad$

## Answers to Exercise Eight

| a) 0.7 | b) 0.14 | c) 0.65 | d) 7.435 |
| :--- | :--- | :--- | :--- |
| e) 0.432 | f) 1.476 | g) 0.18375 | h) 2.3745 |
| i) 0.063 | j) 0.0746 | k) 0.0035 | l) 3.66 |
| m) 0.04216 | n) 0.003 | o) 9.235 | p) 3.980 |
| q) 0.03 | r) 0.0047 | s) 0.0281 | t) 0.069 |
| u) 0.0001 | v) 10.01 | w) 0.162 | x) 569.21 |
| y) 0.00025 | z) 0.331 |  |  |

y) 0.00025
z) 0.331

## Problems Using Division of Decimals

Division problems usually give information about several of the same things and ask you to find the amount for one thing.

Key words which point to division include

| separated | split |
| :--- | :--- |
| cut | shared |
| What is cost per...? | unit price |
| What is distance per...? | average (speed, cost, weight, time) |

## Exercise Nine

Solve these division problems. Look carefully for the pattern of the problems and underline any key words which point to division. Do an estimation before you find the actual solution.
a) Joanne's little car has a 44.5 L tank. She can drive 525 km on a tank of gas. What is the average distance she can travel per litre of gas? (The answer will be kilometres per litre, so you must divide the kilometres by the litres.)

Estimation: $520 \mathrm{~km} \div 40 \mathrm{~L} \approx 13 \mathrm{~km} / \mathrm{L}$

Actual Solution: $525 \mathrm{~km} \div 44.5 \mathrm{~L}=11.798 \mathrm{~km} / \mathrm{L}$

Joanne's car travels an average of 11.798 kilometres per litre of gas.
b) Weight lifters still talk about pounds, but try this question using the equivalent weight in kilograms.

Al bench-presses 136.36 kilograms when he works out at the gym. The bar already weighs 20.45 kg , so he only needs to put 115.91 kg of weights onto the bar before he lifts it. If each weight is also 20.45 kg , how many weights must he put on the bar? Round your answer to the nearest whole number.

Estimation:

## Actual Solution:


c) Sam earns $\$ 9.68$ an hour at his part-time job. His paycheque last week was $\$ 174.24$ before deductions. How many hours did Sam work for that paycheque?

Estimation:

Actual Solution:
d) If you can solve 30 math questions in 1.5 hours, how long does it take you to solve one of those math questions?
(Hint: You want the average time per question. The answer will be less than one hour, so it may be easier to work out the problem using minutes. Change hours to minutes by multiplying the hours by 60 minutes.
[1.5 hours $\times 60$ minutes $=$ number of minutes]
Estimation:

## Actual Solution:

e) Three communities are hosting a feast to celebrate the coming of spring. The cost will be $\$ 8$ 978.45. How much will each community pay?

Estimation:

## Actual Solution:

f) Joe's snowmobile travelled 121.626 km in 3.5 hours. What was his average speed (kilometres per hour) on his trip?

## Estimation:

## Actual Solution:

g) The class decided to go out every month for a birthday lunch, and whoever had a birthday that month would not have to pay. This month there were three birthdays, so the bill had to be split among only 13 people. The bill was $\$ 156.80$ including taxes and tip. How much did each person pay?

Estimation:

Actual Solution:

h) Dennis likes to cycle 30 km daily so he can stay in shape. He plans to use a cycle path around a local park. The park is rectangular and measures 3.1 km in width and 4.4 km in length. How many times should Dennis ride around this park each day?

Estimation:

Actual Solution:
i) One bundle of prefinished decorative wood covers $2.5 \mathrm{~m}^{2}$ of wall. Frank wants to put this wood on the end wall in his remodeled living room. The wall is 5.5 m long and 2.5 m high. How many bundles of wood will Frank need? (Calculate the area of the wall first.)

Estimation:

Actual Solution:
j) Roofing material is often sold by the square. This term used to refer to the shingles needed to cover 100 square feet. In metric measure, a square will cover approximately $9.5 \mathrm{~m}^{2}$. How many squares of cedar shakes (shingles) do you need for a roof which is 12.2 m by 11.5 m on the front side of the house and 12.2 m by 10 m on the back side of the house? Answer to the nearest square of shakes.

Estimation:

Actual Solution:
k) Marlene is helping her daughter to cut rectangular cards to label her science project. They have a piece of bright orange cardboard that is 1.2 m long and 80 cm wide. Each card is going to be 10 cm by 5 cm in size. How many cards can they cut from this piece of cardboard?

This problem has several steps:

1. rename one of the measurements to the same measure as the other (cm will be most practical).
2. find the area of the cardboard and also the area of a card.
3. then you are ready to answer the question in the problem.

Estimation:

Actual Solution:

## Answers to Exercise Nine

a) Estimation: $520 \mathrm{~km} \div 40 \mathrm{~L} \approx 13 \mathrm{~km} / \mathrm{L}$

Actual Solution: $525 \mathrm{~km} \div 44.5 \mathrm{~L}=11.798 \mathrm{~km} / \mathrm{L}$

Joanne's car travels an average of 11.798 kilometres per litre of gas.
b) Estimation: $120 \mathrm{~kg} \div 20 \mathrm{~kg} \approx 6$ weights

Actual Solution: $115.91 \mathrm{~kg} \div 20.45 \mathrm{~kg}=5.7$ weights
Al must put on 6 more weights.
c) Estimation: $\$ 170 \div \$ 10 \approx 17$ hours

Actual Solution: $\$ 174.24 \div \$ 9.68=18$ hours

Sam worked 18 hours.
d) Estimation: 90 minutes $\div 30$ questions $\approx 3$ minutes

Actual Solution: 90 minutes $\div 30$ questions $=3$ minutes

It takes you 3 minutes to solve one math question.
e) Estimation: $\$ 9000.00 \div 3 \approx \$ 3000.00$

Actual Solution: $\$ 8978.45 \div 3=\$ 2992.82$

Each community will pay \$2992.82
f) Estimation: $100 \mathrm{~km} \div 3$ hours $\approx 33.3 \mathrm{~km} / \mathrm{hr}$

Actual Solution: $121.626 \mathrm{~km} \div 3.5$ hours $=34.75 \mathrm{~km} / \mathrm{hr}$

The average speed was 34.75 kilometres per hour.
g) Estimation: $\$ 150 \div 15 \approx \$ 10$

Actual Solution: $\$ 156.80 \div 13=\$ 12.06$

Each person paid \$12.06.
h) Estimation: $5 \mathrm{~km}+5 \mathrm{~km}+3 \mathrm{~km}+3 \mathrm{~km}=16 \mathrm{~km}$
$30 \mathrm{~km} \div 16 \mathrm{~km} \approx 2$ times around the park
Actual Solution: $4.4 \mathrm{~km}+4.4 \mathrm{~km}+3.1 \mathrm{~km}+3.1 \mathrm{~km}=15 \mathrm{~km}$
$30 \mathrm{~km} \div 15 \mathrm{~km}=2$
Dennis should cycle 2 times around the park.
i) Estimation: $6 \mathrm{~m} \times 3 \mathrm{~m}=18 \mathrm{~m}^{2}$
$18 \mathrm{~m}^{2} \div 3 \mathrm{~m}^{2} \approx 6$ bundles
Actual Solution: $5.5 \mathrm{~m} \times 2.5 \mathrm{~m}=13.75 \mathrm{~m}^{2}$
$13.75 \mathrm{~m}^{2} \div 2.5 \mathrm{~m}^{2}=5.5$

Frank will need 5.5 bundles of wood; he will probably have to buy 6 .
j) Estimation: $12 \mathrm{~m} \times 11 \mathrm{~m}=132 \mathrm{~m}^{2}$
$12 \mathrm{~m} \times 10 \mathrm{~m}=120 \mathrm{~m}^{2}$
$132 \mathrm{~m}^{2}+120 \mathrm{~m}^{2}=252 \mathrm{~m}^{2}$
$252 \mathrm{~m}^{2} \div 10 \mathrm{~m}^{2} \approx 25.2$ squares or cedar shakes
Actual Solution: $12.2 \mathrm{~m} \times 11.5 \mathrm{~m}=140.3 \mathrm{~m}^{2}$
$12.2 \mathrm{~m} \times 10 \mathrm{~m}=122 \mathrm{~m}^{2}$
$140.3 \mathrm{~m}^{2}+122 \mathrm{~m}^{2}=262.3 \mathrm{~m}^{2}$
$262.3 \mathrm{~m}^{2} \div 9.5 \mathrm{~m}^{2}=27.6$

You will need 28 squares of cedar shakes.
k) Estimation: $100 \mathrm{~cm} \times 100 \mathrm{~cm}=10000 \mathrm{~cm}^{2}$
$10 \mathrm{~cm} \times 5 \mathrm{~cm}=50 \mathrm{~cm}^{2}$
$10000 \mathrm{~cm}^{2} \div 50 \mathrm{~cm}^{2} \approx 200$
Actual Solution: $\quad 120 \mathrm{~cm} \times 80 \mathrm{~cm}=9600 \mathrm{~cm}^{2}$
$10 \mathrm{~cm} \times 5 \mathrm{~cm}=50 \mathrm{~cm}^{2}$
$9600 \mathrm{~cm}^{2} \div 50 \mathrm{~cm}^{2}=192$

Marlene and her daughter can make 192 cards.

## Topic A: Self-Test

A. Find the quotients.
4 marks
a) $4 \longdiv { 1 7 . 6 }$
b) $5 \longdiv { 2 9 . 3 }$
c) $0 . 3 \longdiv { 3 9 6 }$
d) $0 . 0 7 \longdiv { 1 . 6 6 6 }$
B. Divide and round the quotient to

4 marks
a) the nearest tenth

$$
2 . 3 \longdiv { 1 0 . 4 }
$$

b) the nearest hundredth $0 . 1 2 \longdiv { 0 . 4 7 3 9 }$

## C. Find the quotients.

6 marks
a) $51 \div 10=$ $\qquad$ b) $47.2 \div 10=\square$
c) $81.81 \div 100=$
d) $1.93 \div 100=$ $\qquad$
e) $62.811 \div 1000=$ $\qquad$ f) $0.5 \div 10=$ $\qquad$
D. Problems 4 marks
a) A train travelled 252.5 km in 4.25 hours. What was its average speed in kilometres per hour?

Estimation:

Actual Solution:
b) The new shirts for the slow-pitch team were $\$ 181.30$ in total. How much should the manager charge each of the fourteen team members for a shirt?

Estimation:

## Actual Solution:

Answers to Topic A Self-Test
Part A
a) 4.4
b) 5.86
c) 1320
d) 23.8

## Part B

a) 4.5
b) 3.95

## Part C

a) 5.1
b) 4.72
c) 0.8181
d) 0.0193
e) 0.062811
f) 0.05

## Part D

a) Estimation: $250 \mathrm{~km} \div 5$ hours $\approx 50 \mathrm{~km} / \mathrm{hr}$

Actual Solution: $252.5 \mathrm{~km} \div 4.25$ hours $=59.411764 \mathrm{~km} / \mathrm{hr}$
The average speed is 59.41 kilometres per hour.
b) Estimation: $\$ 180 \div 15 \approx \$ 12$

Actual Solution: $\$ 181.30 \div 14=\$ 12.95$
The manager should charge each team member \$12.95.

## Unit 4 Review

1) Write the decimal in the correct place in the quotient:
a)
864
$7 \longdiv { 6 0 . 4 8 }$
b) $\quad 1 8 \longdiv { 4 3 . 7 4 }$
c) $\quad \begin{array}{r}43 \\ \hline \\ \hline 90.3\end{array}$
d) $\quad 9 \longdiv { 1 8 . 4 5 }$
e) $\begin{array}{r}1683 \\ 2 5 \longdiv { 4 2 0 . 7 5 }\end{array}$
f) $\quad 6 0 \longdiv { 1 4 . 4 }$
2) Find the quotients:
a)
$3 4 \longdiv { 1 7 9 . 1 4 6 }$
b) $8 1 \longdiv { 5 1 7 . 5 9 }$
c)
$7 5 \longdiv { 6 9 4 7 . 2 5 }$
d)
$5 7 \longdiv { 3 0 . 2 1 }$
e) $2 5 \longdiv { 1 5 8 . 7 5 }$
f)
$7 5 \longdiv { 6 1 . 5 }$
3) Find the quotients:
a) $3 . 4 \longdiv { 2 3 . 4 6 }$
b) $\quad 6 . 7 \longdiv { 2 3 . 4 5 }$
c) $2 . 1 \longdiv { 0 . 1 1 3 4 }$
d) $1 . 0 0 5 \longdiv { 0 . 2 5 9 2 9 }$
e) $0 . 3 3 \longdiv { 2 . 1 1 2 }$
f) $0 . 7 2 \longdiv { 2 . 5 8 7 6 8 }$
4) Find the quotient, round the quotient to the nearest hundredth:
a) $14.71 \div 3.1=$
b) $81.13 \div 12=$
c) $4.93 \div 6=$
d) $17.92 \div 12.36=$
e) $15.68 \div 2.2=$
f) $2.61 \div 5.1=$
5) Divide, round your answer to the nearest tenth:
a) $98.9 \div 1.3=$
b) $1.742 \div 3.2=$
c) $0.64 \div 3=$
d) $10.48 \div 3.2=$
e) $43.893 \div 2.2=$
f) $2.61 \div 5.2=$
6) Divide by 10,100 or 1000 . Make sure you use the shortcut!
a) $53.4 \div 10=$
b) $10000 \div 1000=$
c) $3427013 \div 1000=$
d) $2 \div 100=$
e) $124.32 \div 100=$
f) $62.911 \div 100=$
g) $0.34 \div 100=$
h) $1.22 \div 100=$
i) $479.99 \div 1000=$
j) $3411.2 \div 1000=$
k) $12.12 \div 1000=$
7) $4.2 \div 1000=$
8) Solve the following word problems:
a) Len pays $\$ 35.89$ each month to pay off his interest free loan of $\$ 304.73$. How many months will it take to pay off the loan?
b) Lola paid $\$ 47.71$ for her fill up of gas in her car. The cost of gas that day was $\$ 1.02$ per litre. How much gas did she buy?
c) The Lee family children want to adopt a dog from the BC SPCA. The four children will split the cost of the dog evenly.

The costs of buying a dog are:

| $\$ 395.46$ | Adoption cost |
| :--- | :--- |
| $\$ 159.30$ | vet care |
| $\$ 67.49$ | immunizations |
| $\$ 38.99$ | first month of food |
| $\$ 278.34$ | extra gear a dog needs (collars, leash, toys, crate, and a bed) |
| $\$ 30.00$ | Licence fee |

What will each child pay?
d) Oliver and Dougal are making homemade valentines cards for the kids at their daycare. They have a piece of pink cardboard that is 43.5 cm long and 62.4 cm wide. Each card is going to be 7.5 cm by 10 cm in size. How many cards can they cut out of this piece of cardboard.

## Answers to Review

1) 

a) 8.64
b) 2.43
c) 4.3
d) 2.05
e) 16.83
f) 0.24
2)
a) 5.269
b) 6.39
c) 92.63
d) 0.53
e) 6.35
f) 0.82
3)
a) 6.9
b) 3.5
c) 0.054
d) 0.258
e) 6.4
f) 3.594
4)
a) 4.75
b) 6.76
c) 0.82
d) 1.45
e) 7.13
f) 0.51
5)
a) 76.1
b) 0.5
c) 0.2
d) 3.3
e) 20
f) 0.5
6)
a) 5.34
b) 10
c) 3427.013
d) 0.02
e) 1.2432
f) 0.62911
g) 0.0034
h) 0.0122
i) 0.47999
j) 3.4112
k) 0.01212

1) 0.0042
2) 

a) $\$ 8.49$ months (so really 9 months)
b) 46.77 litres
c) $\$ 242.40$ each
d) $2714.4 \mathrm{~cm}^{2} \div 75 \mathrm{~cm}^{2}=36.192$, so, the boys can make 36 cards in total.

## Test time!

Please see your instructor to get your practice test.

When you are confident, you can write your unit 4 test.

## Congratulations!

