Chapter 2 KEY

In Your Words

Here are some of the important mathematical words of this unit.
Build your own glossary by recording definitions and examples here. The first one is done for you.

negative number any number less than zero. A negative number appears to the left of zero on a number line. For example, -2, -18, and -4000 are negative numbers.

integer

positive integer

negative integer

opposite integers

zero pair

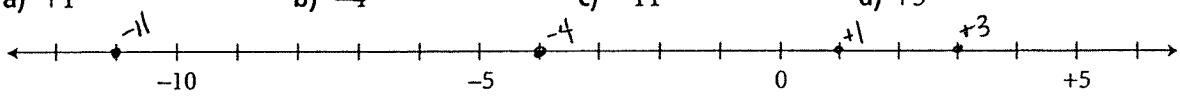
List other mathematical words you need to know.

Unit Review

LESSON

APK **1.** Show each integer on the number line.

a) +1 b) –4 c) –11 d) +3



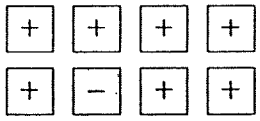
2. a) Place either < or > between the integers.

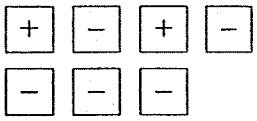
i) +1 ___7___ –2 ii) –8 ___<___ 0 iii) –11 ___>___ –18

b) Order all the integers in part a from least to greatest.

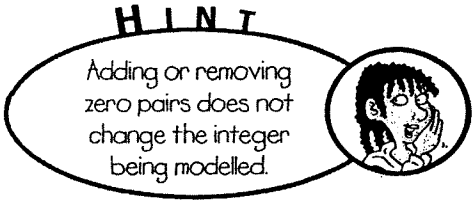
___-18___, ___-11___, ___-8___, ___-2___, ___0___, ___+1___

2.1 **3.** Write the integer modelled by each set of tiles.

a)  +6

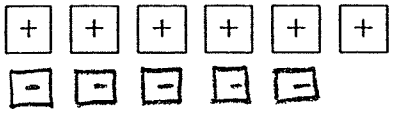
b)  -3

4. One way to model –2 is shown.
Draw tiles to model –2 three more ways.

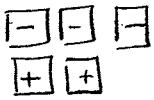


2.2 **5.** Use tiles to add.

a) (+6) + (–5) = ___+1___



b) (–3) + (+2) = ___-1___



2.3 **6.** What type of integer do you get when you add two negative integers?
Explain how you know.

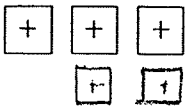
Another negative integer further away from zero than either one being added

ie) (-1)+(-5) = -6

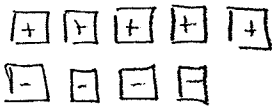
LESSON

2.4 **7.** Use tiles to add or subtract.

a) (+3) + (+2) = +5

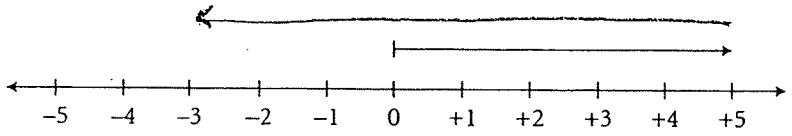


b) (+5) + (−4) = +1

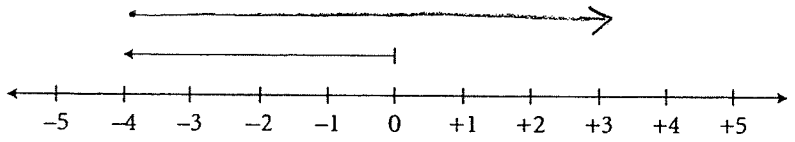


2.5 **8.** Use a number line to add or subtract.

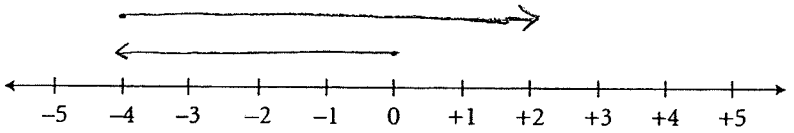
a) (+5) + (−8) = −3



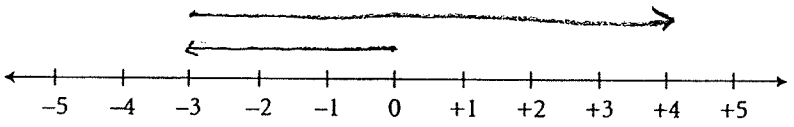
b) (−4) − (−7) = +3



c) (−4) + (+6) = +2



d) (−3) − (−7) = +4



9. Calculate each difference.

a) The temperature went from −7°C to +8°C.

+15°C change in temperature

b) The temperature went from +20°C to +3°C.

−17°C change in temperature

Chapter 5 KEY

In Your Words

Here are some of the important mathematical words of this unit.
Build your own glossary by recording definitions and examples here. The first one is done for you.

improper fraction

a fraction where the numerator is greater than the denominator; for example, $\frac{3}{2}$ is an improper fraction

common denominator

mixed number

unit fraction

related denominators

unrelated denominators

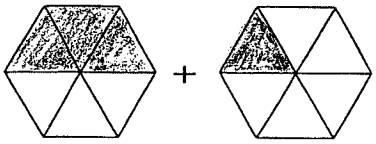
List other mathematical words you need to know.

Unit Review

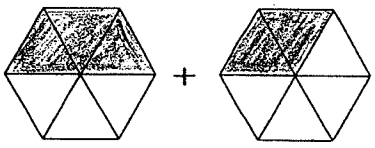
LESSON

5.1 **1.** Colour each pair of Pattern Block shapes to help you to add the fractions.

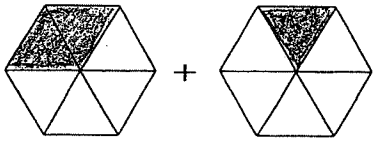
a) $\frac{1}{2} + \frac{1}{6} = \frac{4}{6} = \frac{2}{3}$



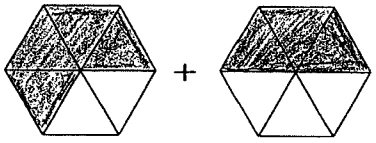
b) $\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$



c) $\frac{1}{3} + \frac{1}{6} = \frac{3}{6} = \frac{1}{2}$

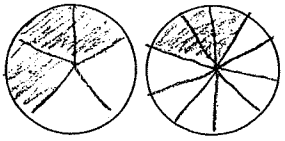


d) $\frac{2}{3} + \frac{1}{2} = 1\frac{1}{6}$

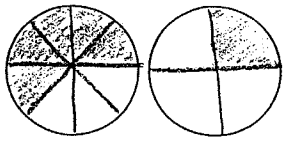


2. Use fraction circles to find each sum.

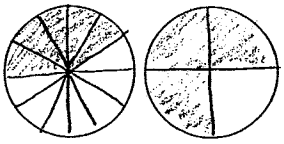
a) $\frac{3}{5} + \frac{3}{10} = \frac{9}{10}$



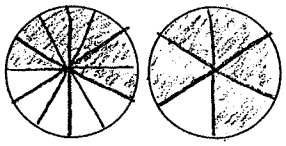
b) $\frac{5}{8} + \frac{1}{4} = \frac{7}{8}$



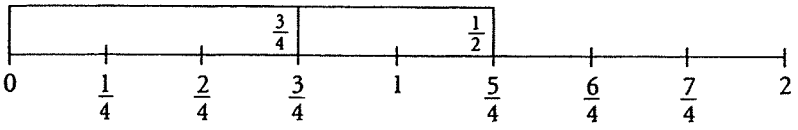
c) $\frac{5}{12} + \frac{3}{4} = \frac{14}{12} = 1\frac{2}{12} = 1\frac{1}{6}$



d) $\frac{5}{6} + \frac{7}{12} = \frac{17}{12} = 1\frac{5}{12}$.



5.2 **3.** Write the addition equation represented by the diagram.



$\frac{3}{4} + \frac{1}{2} = \frac{5}{4} = 1\frac{1}{4}$

LESSON

5.2 **4.** ~~Use fraction strips and number lines to add.~~ Add.

a) $\frac{2}{3}+\frac{1}{6}=\frac{4}{6}+\frac{1}{6}=\frac{5}{6}$ b) $\frac{1}{2}+\frac{3}{10}=\frac{5}{10}+\frac{3}{10}=\frac{8}{10}=\frac{4}{5}$ c) $\frac{3}{4}+\frac{11}{12}=\frac{9}{12}+\frac{11}{12}=\frac{20}{12}=1\frac{8}{12}=1\frac{2}{3}$

d) $\frac{3}{2}+\frac{2}{5}=\frac{15}{10}+\frac{4}{10}=\frac{19}{10}=1\frac{9}{10}$ e) $\frac{7}{8}+\frac{1}{2}=\frac{7}{8}+\frac{4}{8}=\frac{11}{8}=1\frac{3}{8}$ f) $\frac{2}{3}+\frac{3}{4}=\frac{8}{12}+\frac{9}{12}=\frac{17}{12}=1\frac{5}{12}$

5.3 **5.** Zach took $\frac{5}{12}$ of an hour to drive to work and $\frac{2}{3}$ of an hour to drive home.

a) Write the total time it took Zach to drive to and from work as a fraction of an hour.

$\frac{5}{12}+\frac{2}{3}=\frac{5}{12}+\frac{8}{12}=\frac{13}{12}=1\frac{1}{12}$ of an hour.

b) Write the time in part a in minutes. 65 minutes

6. Estimate, then add.

a) $\frac{3}{4}+\frac{2}{5}=\frac{15}{20}+\frac{8}{20}$ Estimate: ___ Sum: $\frac{23}{20}=1\frac{3}{20}$

b) $\frac{5}{8}+\frac{1}{3}=\frac{15}{24}+\frac{8}{24}$ Estimate: ___ Sum: $\frac{23}{24}$

c) $\frac{5}{9}+\frac{1}{6}=\frac{10}{18}+\frac{3}{18}$ Estimate: ___ Sum: $\frac{13}{18}$

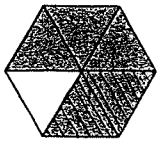
d) $\frac{1}{2}+\frac{3}{7}=\frac{7}{14}+\frac{6}{14}$ Estimate: ___ Sum: $\frac{13}{14}$

e) $\frac{2}{3}+\frac{3}{5}=\frac{10}{15}+\frac{9}{15}$ Estimate: ___ Sum: $\frac{19}{15}=1\frac{4}{15}$

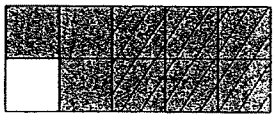
f) $\frac{4}{5}+\frac{5}{6}=\frac{24}{30}+\frac{25}{30}$ Estimate: ___ Sum: $\frac{49}{30}=1\frac{19}{30}$

5.4 **7.** Use each diagram to find the difference.

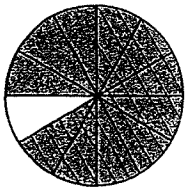
a) $\frac{5}{6}-\frac{1}{3}=\frac{3}{6}=\frac{1}{2}$



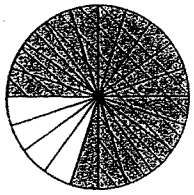
b) $\frac{9}{10}-\frac{3}{5}=\frac{3}{10}$



c) $\frac{11}{12}-\frac{2}{3}=\frac{3}{12}=\frac{1}{4}$



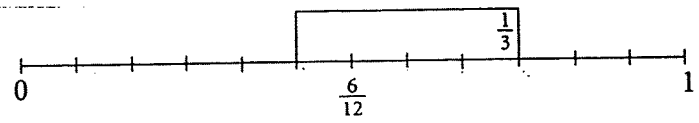
d) $\frac{4}{5}-\frac{3}{4}=\frac{1}{20}$



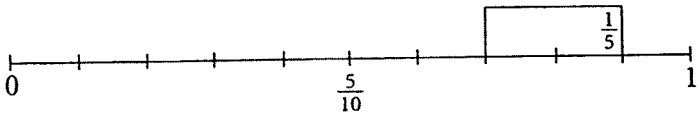
LESSON

5.4 **8.** Write the subtraction equation represented by each diagram.

a) $\frac{9}{12} - \frac{1}{3} = \frac{5}{12}$



b) $\frac{9}{10} - \frac{1}{5} = \frac{7}{10}$



5.5 **9.** Estimate, then subtract.

a) $\frac{7}{8} - \frac{3}{4} = \frac{7}{8} - \frac{6}{8}$ Estimate: ___ Difference: $\frac{1}{8}$

b) $\frac{3}{2} - \frac{3}{8} = \frac{12}{8} - \frac{3}{8}$ Estimate: ___ Difference: $\frac{9}{8} = 1\frac{1}{8}$

c) $\frac{5}{4} - \frac{7}{12} = \frac{15}{12} - \frac{7}{12}$ Estimate: ___ Difference: $\frac{8}{12} = \frac{2}{3}$

d) $\frac{2}{3} - \frac{2}{9} = \frac{6}{9} - \frac{2}{9}$ Estimate: ___ Difference: $\frac{4}{9}$

5.6 **10.** Add.

a) $3\frac{7}{8} + 1\frac{5}{8} = 4\frac{12}{8} = 5\frac{4}{8} = 5\frac{1}{2}$ b) $2\frac{2}{3} + 4\frac{5}{12} = 2\frac{8}{12} + 4\frac{5}{12} = 6\frac{13}{12} = 7\frac{1}{12}$

11. On Sunday, Maya studied $1\frac{1}{4}$ h for her math exam.
On Monday she studied $1\frac{2}{3}$ h.
What is the total time Maya studied?

$1\frac{1}{4} + 1\frac{2}{3} = 1\frac{3}{12} + 1\frac{8}{12} = 2\frac{11}{12}$ h.

5.7 **12.** Subtract.

a) $5\frac{11}{12} - 1\frac{7}{12} = 4\frac{4}{12} = 4\frac{1}{4}$ b) $2\frac{5}{7} - 1\frac{3}{14} = 2\frac{10}{14} - 1\frac{3}{14} = 1\frac{7}{14} = 1\frac{1}{2}$

13. Leigh has $4\frac{1}{2}$ m of ribbon.
He uses $1\frac{3}{4}$ m to wrap a present and $\frac{1}{3}$ m to make a bow.
How much ribbon is left?

$4\frac{1}{2} - 1\frac{3}{4} - \frac{1}{3} = 4\frac{6}{12} - 1\frac{9}{12} - \frac{4}{12} = \frac{54}{12} - \frac{21}{12} - \frac{4}{12} = \frac{29}{12} = 2\frac{5}{12}$

$2\frac{5}{12}$ m.

Chapter 3 KEY

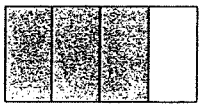
In Your Words

Here are some of the important mathematical words of this unit.
Build your own glossary by recording definitions and examples here. The first one is done for you.

fraction

a way to show part of a whole; for example, $\frac{3}{4}$ shows 3 parts of a whole that has been divided into 4 equal parts

A fraction also shows division: $3 \div 4$



benchmark

equivalent fractions

repeating decimal

terminating decimal

percent

List other mathematical words you need to know.

Unit Review

LESSON

3.1 **1.** Write each fraction as a decimal.
Identify each decimal as terminating or repeating.

Tip
$\frac{3}{4} = 3 \div 4 = 0.75$

a) $\frac{3}{10}$ 0.3 terminating

b) $\frac{1}{3}$ $0.\overline{3}$ repeating

c) $\frac{7}{8}$ 0.875 terminating

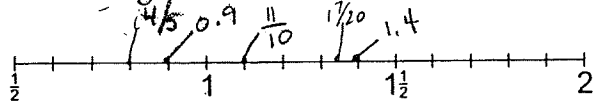
d) $\frac{1}{5}$ 0.2 terminating

2. Write each decimal as a fraction or mixed number.

a) 0.6 $\frac{6}{10} = \frac{3}{5}$ b) 0.75 $\frac{75}{100} = \frac{3}{4}$ c) 2.5 $2\frac{5}{10} = 2\frac{1}{2}$ d) $0.\overline{7}$ $\frac{7}{9}$

3.2 **3.** Order the numbers from least to greatest. Use the number line.

0.9, $\frac{11}{10}$, $\frac{4}{5}$, 1.4, $1\frac{7}{20}$



From least to greatest: $\frac{4}{5}$, 0.9, $\frac{11}{10}$, $1\frac{7}{20}$, 1.4

4. Use equivalent fractions to order these numbers from greatest to least:

$2\frac{1}{2}, 1\frac{3}{8}, 2\frac{3}{5}, 1\frac{7}{10}$ $2\frac{1}{2} = 2\frac{20}{40}$ $1\frac{3}{8} = 1\frac{15}{40}$ $2\frac{3}{5} = 2\frac{24}{40}$ $1\frac{7}{10} = 1\frac{28}{40}$

From greatest to least: $2\frac{3}{5}$, $2\frac{1}{2}$, $1\frac{7}{10}$, $1\frac{3}{8}$

5. Use place value to order these numbers from least to greatest:

1.3825, $1\frac{4}{5}$, 1.236, $1\frac{1}{3}$, 1.333, 1.810
1.8 $1.\overline{3}$ $1\frac{1}{3}$

From least to greatest: 1.236, 1.333, $1.\overline{3}$, 1.3825, $1\frac{4}{5}$, 1.810.

LESSON

3.3 **6.** Matthew bought a shirt for $21.99, pants for $36.78, and a belt for $10.50.

What is the total amount for the purchases without sales tax? $69.27

7. Kerry has grown 2.1 cm since last September.
She is now 165 cm tall. 165 - 2.1

How tall was Kerry last September? 162.9 cm

3.4 **8.** Multiply. Use front-end estimation to place the decimal point in the answer.

a) $0.5 \times 0.7 =$ 0.35 b) $2.9 \times 0.8 =$ 2.32

c) $3.5 \times 3.2 =$ 11.2 d) $1.4 \times 2.9 =$ 4.06

9. Anne cycles 15.5 km each hour.
She cycles for 3.25 h. 15.5 km × 3.25 h =

How far does Ann cycle? 50.375 km

3.5 **10.** Divide. Write each quotient to the nearest tenth where necessary.

a) $8.7 \div 0.6 =$ 14.5 b) $5.7 \div 1.5 =$ 3.8

c) $43.1 \div 2.1 =$ $20.\overline{523809}$ d) $23.5 \div 4.8 =$ $4.89583\overline{3}$

11. Amal bought 3.5 kg of bananas for $2.42. $\frac{3.5\text{ kg}}{\$2.42} = \frac{1\text{ kg}}{x}$ $x =$

What was the cost of 1 kg of bananas? $0.69

LESSON

3.6 **12.** Evaluate.

a) $5.3 - 2.3 \times 2 =$ _____

$5.3 - 4.6$

0.7

b) $(67.2 + 12) \div 2.4 - 1.2 =$ _____

$79.2 \div 2.4 - 1.2$

$33 - 1.2$

31.8

Tip

The order of operations with decimals is the same as with whole numbers.

3.7 **13.** Write each fraction as a decimal and a percent.

a) $\frac{1}{2} = 0.5 = 50\%$

b) $\frac{17}{25} = 0.68 = 68\%$

c) $\frac{19}{20} = 0.95 = 95\%$

d) $\frac{3}{5} = 0.6 = 60\%$

3.8 **14.** Ivana got $\frac{21}{25}$ on her science test. $\Rightarrow 84\%$

She got 86% on her math test.

Which of her test marks is greater? Explain.

Ivana's math test mark is greater.

15. Find each percent.

a) 3% of 25

$3\% = \frac{3}{100} = 0.03$

$0.03 \times 25 = 0.75$

b) 24% of $9.00

$24\% = \frac{24}{100} = \frac{x}{9.00}$

$\$2.16$

c) 40% of 95

$\frac{40}{100} = \frac{x}{95}$

$x = 38$

16. Sylvia is going to buy a new jacket.
The regular price is $68.00.
The jacket is on sale for 25% off.
There is 14% sales tax on the jacket.
How much will Sylvia pay for the jacket?

$\frac{25}{100} = \frac{x}{\$68.00}$

$x = \$17.00$

$\$68.00 - \$17.00 = \$51.00$

$\frac{14}{100} = \frac{x}{51.00}$

$x = \$7.14$

$\$51.00 + \$7.14 = \$58.14$

Sylvia will pay $58.14 for the jacket.

In Your Words

Here are some of the important mathematical words of this unit.
Build your own glossary by recording definitions and examples here. The first one is done for you.

divisibility rules *rules I can use to find out multiples of numbers and factors of numbers. For example, to find out if a certain number is a multiple of 3, I add the digits of the number; if the sum is a multiple of 3, then the number is also a multiple of 3.*

algebraic expression

variable

evaluate

equation

solve an equation

List other mathematical words you need to know.

Unit Review

LESSON

1.1 **1.** a) Circle the numbers that are divisible by 4.

(312) 1407 (204) 3441 (640) 763

b) How do you know if a number is divisible by 4?

2. a) Circle the numbers that are divisible by 2 and by 3.

(606) (330) 501 (2466) (492) (9342)

b) What other number are the circled numbers in part a divisible by? 6

How do you know?

1.2 **3.** Which numbers below are divisible by 8? Divisible by 5?
How do you know?

a) 244: Divisible by: neither

b) 160: Divisible by: 5+8

c) 315: Divisible by: 5

d) 608: Divisible by: 8

4. Use your answers from question 3 to help you list all the factors of each number.

a) 244: 1, 2, 4, 61, 122, 244

b) 160: 1, 2, 4, 5, 8, 10, 16, 20, 32, 40, 80, 160

c) 315: 1, 3, 5, 7, 9, 15, 21, 35, 45, 63, 105, 315

d) 608: 1, 2, 4, 8, 16, 38, 76, 152, 304, 608

LESSON

1.3 **5.** Write an algebraic expression for each phrase. Use the variable n.

a) Three times a number: $3n$

b) Five less than a number: $n-5$

c) Twenty divided by a number: $20 \div n$ or $\frac{20}{n}$

d) Seven more than four times a number: $4n+7$

6. Evaluate each expression for $n = 5$.

a) $n + 7 =$ 12 b) $10 - n =$ 5 c) $2n + 3 =$ 13

1.4 **7.** a) Zadie climbed four sets of stairs every minute for the Charity Stair Climb Fundraiser. Complete this table. The pattern continues.

Time (minutes)	1	2	3	4	5	6	7	8
Sets of stairs climbed	4	8	12	16	20	24	28	32

b) How many sets of stairs will Zadie have climbed after 15 minutes? 60

8. Write a relation for the pattern rule for each number pattern.

a) 3, 6, 9, 12, 15, . . . $3n$

b) 8, 9, 10, 11, 12, . . . $n+1$

1.5 **9.** Complete each table.
How is each Output number related to its Input number?

a)

Input n	Output $3n + 5$
1	8
2	11
3	14
4	17
5	20

b)

Input n	Output $5n + 3$
1	8
2	13
3	18
4	23
5	28

c)

Input n	Output $5n - 3$
1	2
2	7
3	12
4	17
5	22

LESSON

10. Use algebra. Write a relation for each table.

a)

Input m	Output
1	9
2	11
3	13
4	15
5	17

$2n+7$

b)

Input m	Output
1	9
2	16
3	23
4	30
5	37

$7m+2$

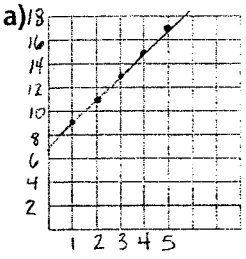
c)

Input m	Output
1	5
2	12
3	19
4	26
5	33

$7m-2$

1.6 **11.** Graph each relation in question 10.

a)



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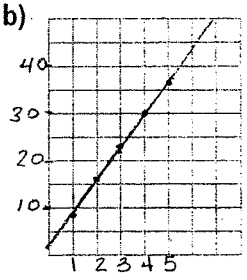

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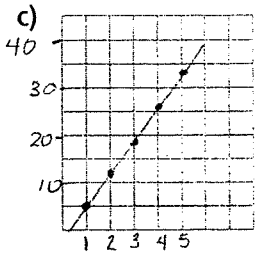


1.7 **12.** Write an equation for each sentence.
Let n represent the number.

a) Four times a number is sixteen. $4n=16$

b) Eight subtracted from four times a number is sixteen. $4n-8=16$

c) Twelve more than four times a number is sixteen. $4n+12=16$

d) Thirty-two minus four times a number is sixteen. $32-4n=16$

13. Write an equation for each sentence. Let n represent the number.

a) Four less than a number is sixteen. $n-4=16$

b) A number divided by five is ten. $n \div 5 = 10$

c) Five more than three times a number is eleven. $3n+5=11$

1.8 **14.** Robin walked twice around a lake, plus an extra 3 km.
Her pedometer showed that she had walked a total of 19 km.
Write then solve an equation to find how far it is around the lake.

$2n+3=19$

$2n+3=19$
$-3 \quad -3$
$\frac{2n}{2} = \frac{16}{2}$
$n = 8$

It is 8 km around the lake.

Chapter 6 KEY

In Your Words

Here are some of the important mathematical words of this unit.
Build your own glossary by recording definitions and examples here. The first one is done for you.

solve by inspection

I solve an equation by thinking about the numbers in the equation and how they are related. For example, to solve $x + 7 = 10$: I think, "Which number do I add to 7 to get 10?" The answer, 3, is the solution to the equation, so I write $x = 3$.

solve by systematic trial

verify a solution

balance-scales model

preserving equality

solve using algebra

List other mathematical words you need to know.

Unit Review

LESSON

6.1 **1.** Write an equation you can use to solve each problem.
Solve each equation by inspection or systematic trial.

a) Gabrielle wants to buy a new snowboard that costs $300.
She has $180 in her bank account.
How much more must Gabrielle save so she can buy the snowboard?

$\$180 + n = \$300$

$180 + n = 300$
$-180 \quad -180$
$n = \$120$

She must save $120.

b) Freddy bought a new music player for $250.
He then had $380 left in his bank account.
How much was in Freddy's account before he bought the player?

$n - \$250 = \$380$

$n - 250 = 380$
$+250 \quad +250$
$n = 630$

He had $630 before his purchase.

c) Emily helps clean a local yoga studio.
She earns $8 per hour.
Last month Emily got a $10 bonus.
Her total earnings were $170.
How many hours did Emily work?

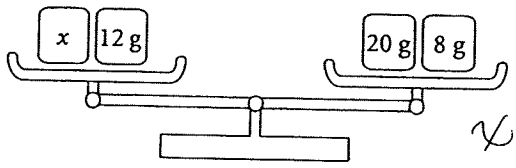
$8n + 10 = \$170$

$8n + 10 = \$170$
$-10 \quad -10$
$\frac{8n}{8} = \frac{\$160}{8}$
$n = 20$

She worked 20 hours.

6.2 **2.** Write an equation that is represented by each balance scales.
Solve the equation. Sketch the steps.

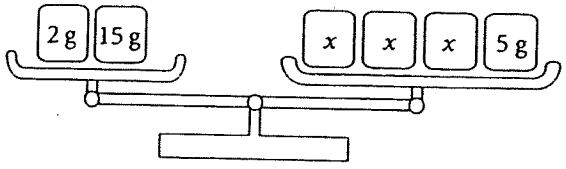
a)



$x + 12 = 28$

$x + 12 = 28$
$-12 \quad -12$
$x = 16$

b)



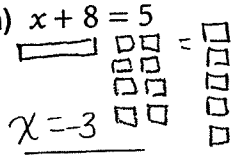
$17 = 3x + 5$
$-5 \quad -5$

$\frac{12}{3} = \frac{3x}{3}$

$4 = x$

LESSON

6.3 **3.** Solve each equation using algebra tiles. Sketch the tiles you used. Verify each solution.

a) $x + 8 = 5$ 

$x = -3$

b) $6 = x - 3$

$x = 9$

c) $-3 = x + 7$

$x = -10$

d) $x - 2 = -5$

$x = -3$

4. Overnight, the temperature dropped by 15°C to –10°C.

a) Write an equation you can solve to find the temperature before it dropped.

$n - 15 = -10$

b) Use tiles to solve the equation. $n = 5°C$

6.4 **5.** Solve each equation using algebra. Verify each solution.

a) $\frac{4n}{4} = \frac{64}{4}$

$n = 26$

b) $2p + 15 = 21$

$-15 \quad -15$

$\frac{2p}{2} = \frac{6}{2}$

$p = 3$

c) $5r - 4 = 26$

$+4 \quad +4$

$\frac{5r}{5} = \frac{30}{5}$

$r = 6$

d) $60 = q + 15$

$-15 \quad -15$

$45 = q$

6. Dylan starts with $40. He saves $12 a week.
After how many weeks will Dylan have each amount?

a) $100 5 weeks)

b) $136 8 weeks).

6.5 **7.** Write an equation for each problem. Solve the equation. Verify each answer.

a) A number increased by 7 is 22. What is the number?

$n + 7 = 22 \quad n = 15$

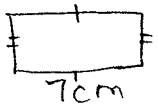
b) William arranges a number of stamps into 5 groups.
There are 12 stamps in each group. How many stamps did William start with?

60 stamps).

c) Six less than a number is 25. What is the number?

$n - 6 = 25 \quad n = 31$

d) A rectangle has a perimeter of 38 cm. The base is 7 cm.
Sketch and label the rectangle. What is its height?



$2l + 2w = 38$
$2(7) + 2w = 38$
$14 + 2w = 38$
$\frac{2w}{2} = \frac{24}{2}$

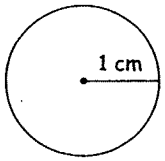
Chapter 4 KEY

In Your Words

Here are some of the important words of this unit.
Build your own glossary by recording definitions and examples here. The first one is done for you.

radius *distance between a point on a circle and the centre of the circle*

For example, the radius of this circle is 1 cm.



diameter

circumference

area of a circle

area of a triangle

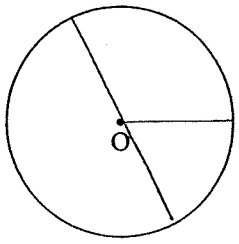
circle graph

List other mathematical words you need to know.

Unit Review

LESSON

4.1 **1.** This circle has its centre at point O.



a) Draw a radius of the circle.
What is the length of the radius? 2cm

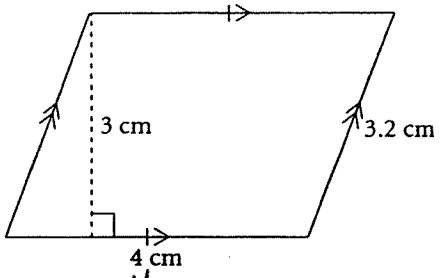
b) Draw a diameter of the circle.
What is the length of the diameter? 4cm

c) Write a relationship between the radius, r, and the diameter, d, of a circle.
$2r = d$

4.2 **2.** Billy plans to put some plastic edging around his circular fish pond.
The diameter of the pond is 5 m.
Find the amount of plastic edging that Billy will need.
$C = \pi d$ $C = (3.14)(5m)$ $C = 15.7m$.

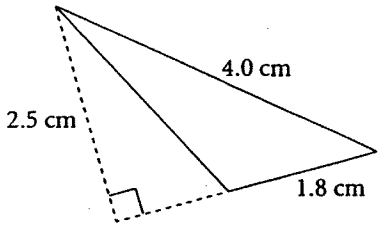
4.3 4.4 **3.** Find the area of each shape.

a)



Base = 4cm
Height = 3cm
Area = base × height
Area = 4cm × 3cm = $12cm^2$
The area is $12cm^2$.

b)



$A = \frac{bh}{2}$
$= \frac{(1.8cm)(2.5cm)}{2}$
$A = 2.25cm^2$
The area is $2.25cm^2$

4.5 **4.** Estimate the area of each circle, then calculate the area to the nearest square unit.

a) radius of 4 mm

Estimate: $48mm^2$
Area: $50.24mm^2$
$A = \pi r^2$
$= (3.14)(4mm)(4mm)$
$A = 50.24mm^2$

b) diameter of 10.1 m

Estimate: $75m^2$
Area: $80.07785m^2$
$d \div 2 = r$ $r = 5.05$
$A = \pi r^2$
$= (3.14)(5.05m)(5.05m)$

Tip
Use $\pi = 3$ in your estimates.

LESSON

16 47

5. Kelly and her friends plan to start a rock band. They will play in their town and in the surrounding area. The band has made this table to show its expenses as percents of what it will earn.

Expenses of Kelly and the Rockers

Type of Expense	Percent of budget	Each percent as an angle
Advertising	10%	36°
Clothes	20%	72°
Equipment	25%	90°
Food	15%	54°
Travel	30%	108°

a) Complete the table.

b) Draw and label a circle graph.

c) The band estimates it will earn $10 000 from its gigs. $\frac{15}{100} = \frac{\quad}{\$10\,000}$
How much money will the band spend on food? $1500

d) Which type of expense is one-half the amount spent on clothes? Advertising.
How can you tell this:

i) from the table? _____

ii) from the graph? _____

_____

e) The band wants to spend $5000 on equipment upgrades. $\frac{25}{100} = \frac{5000}{x}$
How much will the band have to earn to be able to do this? $20 000

f) Write a question you can answer from the graph.

_____

_____

g) Answer your question.

_____

Chapter 8 KEY

In Your Words

Here are some of the important mathematical words of this unit.
Build your own glossary by recording definitions and examples here. The first one is done for you.

parallel lines *are lines on the same flat surface that never meet: the lines on this file card are parallel*

perpendicular lines

perpendicular bisector

angle bisector

coordinate grid

ordered pair

List other mathematical words you need to know.

Unit Review

LESSON

8.1 8.2 **1.** Draw line segment FG.

a) Draw a parallel line segment. Label it HJ.
Explain your strategy for drawing the parallel segment.

_____

_____

b) Draw the perpendicular bisector of HJ. Label it KM.
Explain your strategy for drawing the perpendicular segment.

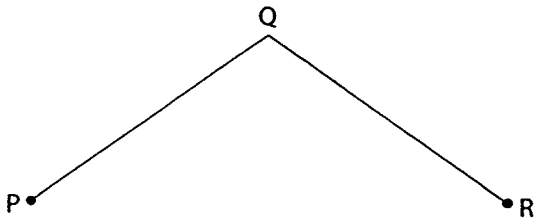
_____

_____

_____

_____

8.3 8.4 **2.** ∠PQR is an obtuse angle.
Draw the bisector of ∠PQR.
Label it KQ.
Draw the perpendicular bisector of QR.
Label it MN.
MN intersects QR at J.



a) What do you know about ∠PQK?

_____

_____

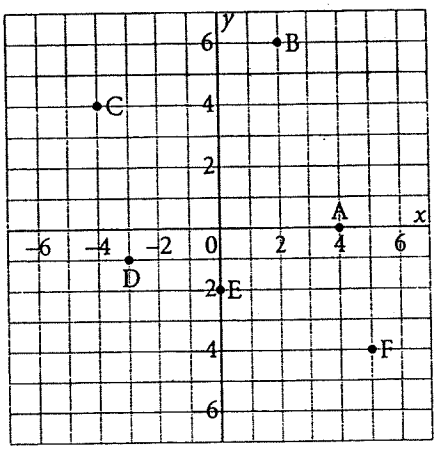
b) What do you know about segment QJ?

_____

_____

LESSON

8.5 **3.** Use the diagram at the right.



a) The coordinates of D are (-3, -1).

b) The coordinates of F are (5, -4)

c) Point B has coordinates (2, 6).

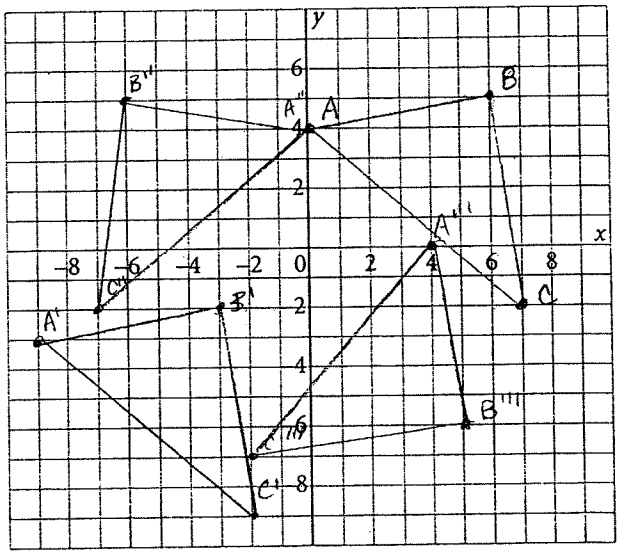
d) The coordinates of the origin are (0, 0).

e) Point E has y-coordinate 0.

f) Point A has x-coordinate 0.

g) Point C is in Quadrant 2.

8.6 8.7 **4.** Plot these points on the coordinate grid:
A(0, 4), B(6, 5), and C(7, –2).
Join the points to form △ABC.
On the same grid, draw the image of △ABC after each transformation.



a) A translation 9 units left and 7 units down
Label the image △A′B′C′.
Write the coordinates of the vertices of △A′B′C′.

A'(-9, -3) B'(-3, -2) C'(-2, -9)

b) A reflection in the y-axis
Label the image △A″B″C″. Write the coordinates of the vertices of △A″B″C″.

A''(0, 4) B''(-6, 5) C''(-7, -2)

c) A rotation of –90° about the origin
Label the image △A‴B‴C‴.
Write the coordinates of the vertices of △A‴B‴C‴.

A'''(4, 0) B'''(5, -6) C'''(-2, -7)

Tip
A clockwise rotation is shown by a negative angle such as –90°.

How are the images alike? Different?_____

_____

_____

Chapter 7 KEY

In Your Words

Here are some of the important mathematical words of this unit.
Build your own glossary by recording definitions and examples here. The first one is done for you.

mean *the sum of all data in a set of numbers divided by the number of data in the set. For example, the mean of 1, 3, 3, 5 is 3, 1 + 3 + 3 + 5 = 12 and 12 ÷ 4 = 3.*

median

outlier

theoretical probability

experimental probability

tree diagram

List other mathematical words you need to know.

Unit Review

LESSON

7.1 **1.** Calculate the mean and mode of each set of data.

a) The weekly allowances of ten students:
$20, $25, $15, $20, $10, $20, $30, $10, $20, $0

Mean: $17 Mode: $20

b) Students' scores on a spelling quiz marked out of 10:
5, 8, 8, 4, 6, 3, 10, 10, 4, 6, 7, 9, 7, 9, 9

Mean: 7 Mode: 9

7.2 **2.** Arrange the data in each set in order, then calculate the median and the range.

a) The heights, in centimetres, of eleven 12-year-olds:
~~160, 155, 162, 152, 161, 154, 153, 160, 158, 155, 159~~

From least to greatest: 152, 153, 154, 155, 155, 158, 159, 160, 160, 161, 162

Median: 158 Range: 10

b) The hours that ten grade 7 students exercised in one week:
~~5, 7,~~ 18, ~~5, 13, 9, 4, 12, 7,~~ 20

From least to greatest: 4, 5, 5, 7, 7, 9, 12, 13, 18, 20

Median: 8 Range: 16

7.3 **3.** These data show the daily temperatures, in degrees Celsius, for two weeks in the summer in Nelson, B.C.:
23, 25, 22, 25, 28, 24, 25, 24, 25, 25, 52, 24, 20, 22

a) Find the mean, median, mode, and range for these data.

Mean: 26 Median: 24.5 Mode: 25 Range: 32

b) Identify the outlier. 52

Why do you think the outlier is so much greater than the other temperatures?

mistake in entering in numbers

LESSON

c) Calculate the mean, median, mode, and range without the outlier.

Mean: 24 Median: 24 Mode: 25 Range: 8

d) When reporting the average daily temperature, should the outlier be included?

Explain. _____

7.3 7.4 **4.** The times, in minutes, that 10 students spent walking home from school one day are:

20, 16, 10, 12, 22, 65, 8, 12, 18, 7

a) Calculate the mean, mode, and median times for these data.

Mean: 19 Mode: 12 Median: 14

b) Identify the outlier. 65

c) Calculate the mean, mode, and median without the outlier.

Mean: $13.\overline{8}$ Mode: 12 Median: 12

d) Which average best describes the data? Explain.

_____

_____

_____

7.4 **5.** Cary scored these points in his last six basketball games: 5, 8, 10, 7, 15, 15

a) Find the mean, median, and mode scores.

Mean: 10 Median: 9 Mode: 15

b) Which measure of central tendency is Cary likely to use to persuade his coach that he is a valuable player? Explain.

Mode - highest value

_____

c) Which measure is the coach likely to use to help her decide if Cary is a valuable player? Explain.

mean - no outlier more reliable data.

_____

_____

LESSON

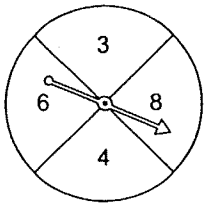
7.5 **6.** A basket of fruit contains 4 apples, 5 bananas, 6 oranges, and 10 kiwi fruits.
A piece of fruit is chosen at random.
Find the probability of each event. Write each probability 3 ways.

a) An orange is picked. $\frac{6}{25} = 6:25 = 24\%$

b) An apple or a banana is picked. $\frac{11}{25} = 11:25 = 44\%$.

c) A grape is picked. $\frac{0}{25} = 0:25 = 0\%$

7.6 **7.** Fran designs a game called *Product 24.*
She makes this spinner:
The pointer is spun twice.
To win this game, the pointer must land on two numbers with a product of 24.



a) Complete the tree diagram to show all possible outcomes for this game.

1st Spin	2nd Spin	Outcomes	
3	3	3, 3	
	8	3, 8	F
	4	3, 4	
	6	3, 6	
8	3	8, 3	F
	8	8, 8	
	4	8, 4	
	6	8, 6	
4	3	4, 3	
	8	4, 8	
	4	4, 4	
	6	4, 6	F
6	3	6, 3	
	8	6, 8	
	4	6, 4	F
	6	6, 6	

b) What is the total number of outcomes? 16

c) How many favourable outcomes are there? 4

d) What is the probability of winning Fran's game? $4/16 = \frac{1}{4}$