

## 5.2 Developing and Working with Formulas

MATHPOWER™ pp. 154-155

1. The formula for the area of a parallelogram is  $A = b \times h$ .

a) Find  $A$  when  $b = 8$  m and  $h = 4$  m.  
 $A = 8 \times 4 = 32 \text{ m}^2$

b) Find  $b$  when  $A = 42 \text{ cm}^2$  and  $h = 7$  cm.  
 $b = \frac{A}{h} = \frac{42}{7} = 6 \text{ cm}$

c) Find  $h$  when  $A = 56 \text{ m}^2$  and  $b = 7$  m.  
 $h = \frac{A}{b} = \frac{56}{7} = 8 \text{ m}$

2. The formula for the area of a triangle is  $A = \frac{1}{2} b \times h$ .

a) Find  $A$  when  $b = 10$  cm and  $h = 3$  cm.  
 $A = \frac{10 \times 3}{2} = 15 \text{ cm}^2$

b) Find  $b$  when  $A = 14 \text{ m}^2$  and  $h = 7$  m.  
 $b = \frac{2A}{h} = \frac{2(14)}{7} = 4 \text{ m}$

c) Find  $h$  when  $A = 36 \text{ cm}^2$  and  $b = 12$  cm.  
 $h = \frac{2A}{b} = \frac{2(36)}{12} = 6 \text{ cm}$

3. a) Complete the table.

Hours ( $h$ )	1	2	3	4	5	6
Cost ( $C$ )	12	24	36	48	60	72

b) Write a formula for the pattern.  
 $C = 12h$

4. If the perimeter and the width of a rectangle are known, the length can be calculated using  $l = \frac{P - 2w}{2}$ . Find the length of the following rectangles.

- a)  $P = 39$  cm,  $w = 9$  cm 10.5 cm
- b)  $P = 45$  cm,  $w = 10.8$  cm 11.7 cm
- c)  $P = 28.8$  m,  $w = 6.6$  m 7.8 cm
- d)  $P = 48.6$  m,  $w = 13.7$  m 10.6 cm

5. a) Complete the table.

Number of Squares	Figure	Perimeter
1		4
2		6
3		8
4		10
5		12
6		14

b) Write a formula for the perimeter in terms of the number of squares.

$P = 2n + 2$

c) What is the perimeter of the figure made from 24 squares?

$P = 2(24) + 2 = 50$

d) How many squares are in the figure with a perimeter of 62?

$62 = 2n + 2$   
 $60 = 2n$   
 $n = 30$

6. The formula for the circumference of a circle is  $C = 2\pi r$ . Write a formula for calculating the radius when the circumference is known.

$r = \frac{C}{2\pi}$

7. Use the formula you wrote in question 6 to find the radius of the circles with each of the following circumferences.

- a) 47.1 cm 7.5 cm
- b) 37.68 cm 6 cm
- c) 78.5 cm 12.5 cm
- d) 157 cm 25 cm

### 5.3 Relations as Ordered Pairs

MATHPOWER™, pp. 156-158

A set of ordered pairs is known as a **relation**. A relation can also be expressed as an equation, as a table of values, or in words.

Use each of the following equations.

- Complete the table of values.
- Describe the relation in words.
- Write the ordered pairs.

1.  $y = -x + 4$

x	y
3	1
1	3
-2	6
-5	9
-7	11

- The sum of  $x$  and  $y$  is equal to four.
- $(3, 1), (1, 3), (-2, 6), (-5, 9), (-7, 11)$

2.  $y = x - 3$

x	y
4	1
0	-3
-1	-4
-3	-6
-6	-9

- The answer when  $y$  is subtracted from  $x$  is 3
- $(4, 1), (0, -3), (-1, -4), (-3, -6), (-6, -9)$

3.  $y = x + 5$

x	y
3	8
1	6
-2	3
-5	0
-7	-2

- $y$  is five more than  $x$
- $(3, 8), (1, 6), (-2, 3), (-5, 0), (-7, -2)$

4.  $y = 3x - 1$

x	y
3	8
2	5
0	-1
-2	-7
-3	-10

- $y$  is one less than three times  $x$
- $(3, 8), (2, 5), (0, -1), (-2, -7), (-3, -10)$

5. For the equation  $y = -x + 7$  find the missing value in each ordered pair.

- $(3, \boxed{4})$
- $(7, \boxed{0})$
- $(\boxed{6}, 1)$
- $(\boxed{7}, 0)$
- $(-2, \boxed{9})$
- $(-4, \boxed{11})$

6. For the equation  $y = x - 5$ , find the missing value in each ordered pair.

- $(2, \boxed{3})$
- $(6, \boxed{1})$
- $(\boxed{6}, 1)$
- $(0, \boxed{-5})$
- $(-3, \boxed{-8})$
- $(\boxed{8}, 3)$

7. List 5 ordered pairs of a relation for which the  $y$ -value is always 3 less than the  $x$ -value.

- $(0, -3), (1, -2), (2, -1), (3, 0), (4, 1)$  or others...

8. List 5 ordered pairs of a relation for which the  $x$ -value is always 4 times the  $y$ -value.

- $(4, 1), (8, 2), (12, 3), (-4, -1), (-8, -2)$  or others...

9. a) Make up a table of values where there is a relationship between the values of  $x$  and  $y$ .

x	y
1	-1
2	0
3	1
4	2
5	3

b) Write an equation for the relation.

ex.  $y = x - 2$