

# Linear relationships

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Teacher: \_\_\_\_\_

This side of this worksheet reviews number skills. The other side of this worksheet refers to *Pearson Mathematics 10-10A* Chapter 1 'Linear relationships' sections 1.1 and 1.2.

**1** Find the total simple interest payable on a \$10 000 loan for 3 years at 6% p.a.

**2** Is (1, 2) the point of intersection of  $y = 3x - 1$  and  $y = -x + 3$ ?

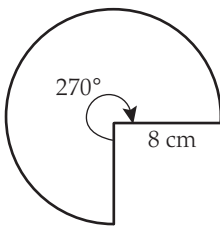
**3** Write 325 000 in scientific notation.

**4** Expand  $5(2x + 3)$ .

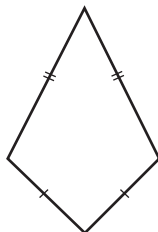
**5** Factorise  $12x^2 - 24x$ .

**6** Expand  $3x(5x - 3)$ .

**7** Find the perimeter of this shape correct to 1 decimal place.

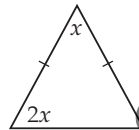



**8** List the shapes needed to make a net for a prism with this base.

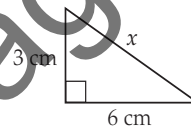



**9** What are the coordinates of a point that is 4 units left, 2 units down and then 4 units right, 3 units up from (-1, -2)?

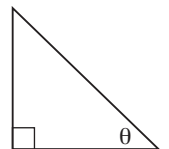
**10** Find the value of the pronumeral in this diagram.




**11** Find the unknown side length in this triangle, correct to 2 decimal places.




**12** Label the hypotenuse, opposite and adjacent sides of this triangle with H, O and A respectively.



**13** Substitute  $m = -2$ ,  $c = 3$  and  $x = -1$  into  $y = mx + c$  to find  $y$ .

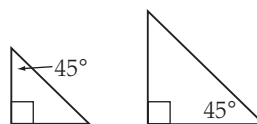
**14** Simplify  $3(x - 1) + 2(x + 1)$  by first expanding.

**15** Solve  $3x - 4 = 8$ .

**16** What is the median of the following data?

5, 6, 7.5, 4, 8, 10, 6

**17** Are the following shapes congruent, similar or neither?



# Linear relationships

## Practice

1A

Show all your  
working

This side of this worksheet covers *Pearson Mathematics 10-10A* Chapter 1 'Linear relationships' sections 1.1 and 1.2.

For online help, go to your *Pearson Mathematics 10-10A* eBook.

1 Solve  $\frac{2x}{6} - 1 = 2$ .

2 Solve  $4x - 5 = 2x + 3$ .

3 Solve  $3(2m + 4) = 3(8 - 2m)$ .

4 Solve  $\frac{5x + 2}{4} = \frac{11 - x}{3}$ .

5 Two more than 5 times a number is 12.  
What is the number?

6 Find the gradient of the line that joins (2, -3)  
and (5, -3).

7 Find the gradient of the line that joins (3, -4)  
and (-1, 2).

8 Find the gradient of the line that joins (-2a, a)  
and (2a, 5a), where  $a$  is a constant.

9 The gradient of the line joining points (2, 3)  
and (a, 9) is -3. What is the value of  $a$ ?

10 The maximum gradient for a wheelchair ramp must  
be  $\frac{1}{12}$ . If the horizontal distance of a particular  
ramp is 7 m for a vertical distance of 0.5 m, will the  
ramp meet this requirement?

Practice  
1A mark:  
/10

# Linear relationships

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Class: \_\_\_\_\_

Teacher: \_\_\_\_\_

This side of this worksheet reviews number skills. The other side of this worksheet refers to *Pearson Mathematics 10-10A* Chapter 1 'Linear relationships' sections 1.3 and 1.4.

- 1** \$50 000 is borrowed for 2 years at 5% p.a. simple interest. Find the total amount to be repaid at the end of the loan.

- 2** Solve these simultaneous equations using the substitution method.

$$y = 3x + 1$$

$$y = -2x - 4$$

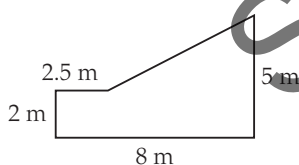
- 3** Write 0.0057 in scientific notation.

- 4** Expand  $3x(4x + 1)$ .

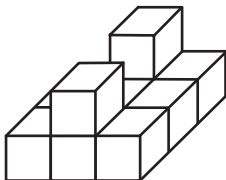
- 5** Factorise  $x^2y - xy^2$ .

- 6** Expand  $(x - 2)(x + 2)$ .

- 7** Find the area of the following shape.

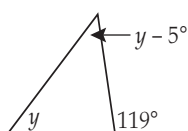



- 8** Draw the left-hand side view of this solid.

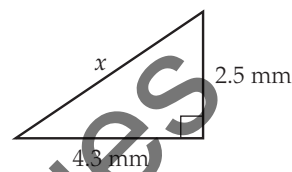


- 9** In which compass direction do you move, going from point  $(-2, 2)$  to  $(2, -2)$ ?

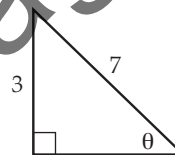
- 10** Find the value of the pronumeral.




- 11** Find the unknown side length in this triangle, correct to 2 decimal places.




- 12** Which trigonometric ratio would you use to find  $\theta$ ?




- 13** Substitute  $(h, k) = (1, 3)$ ,  $x = 3$  and  $m = 0.5$  into  $y = m(x - h) + k$  to find  $y$ .

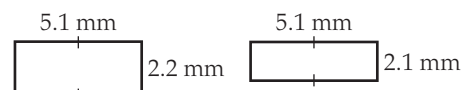
- 14** Simplify  $2(x - 1) - 2(x + 1)$  by first expanding.

- 15** Solve  $7 - 4x = 3$ .

- 16** Calculate the median of the following data.

6, 1, 3, 2, 0, 5, 5

- 17** Are these shapes congruent, similar or neither?




Skills  
1B mark:  
/17

Linear  
relationships

1B

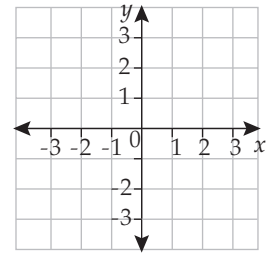
Show all your  
working

This side of this worksheet covers *Pearson Mathematics 10-10A* Chapter 1 'Linear relationships' sections 1.3 and 1.4.

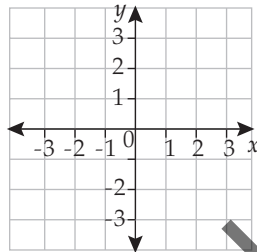
For online help, go to your *Pearson Mathematics 10-10A* eBook.

- 1** What is the  $y$ -intercept and gradient of the graph of  $y = 5x - 1$ ?

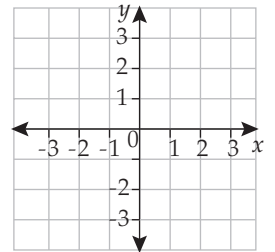
- 2** Find the  $x$ -intercept and the  $y$ -intercept for  $2y = 6 + 3x$  and then sketch its graph.



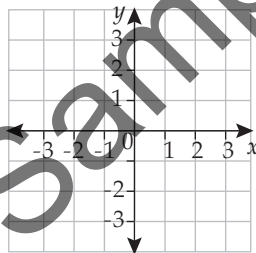
- 3** Sketch a graph of  $y = 3x - 2$  by finding the  $y$ -intercept and the gradient.



- 4** Sketch a graph of  $y = 2$ .



- 5** Sketch a graph of  $y = 2x$ .



- 6** Are these lines parallel?

$$y = 3x + 5$$

$$y - 3x + 7 = 0$$

- 7** Show that the line joining  $(-1, 3)$  and  $(1, 7)$  is parallel to the graph of  $y = 2x + 3$ .

- 8** Show that the line joining the points  $(-2, 5)$  and  $(1, -4)$  is perpendicular to the graph of  $y = \frac{1}{3}x + 5$ .

- 9** Which of the following lines are parallel?

- [1]  $2y - x = 4$
- [2]  $y = -2x + 4$
- [3]  $2x + y = 8$
- [4]  $x = 2y + 5$
- [5]  $4x + 2y = 8$

- 10** Find the equation of the line that passes through  $(0, -3)$  and is perpendicular to the graph of  $x + 4y = 7$ .

Practice  
1B mark:  
/10

# Linear relationships



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Teacher: \_\_\_\_\_

This side of this worksheet reviews number skills. The other side of this worksheet refers to *Pearson Mathematics 10-10A* Chapter 1 'Linear relationships' sections 1.5 and 1.6.

- 1** Asya borrowed \$20 000 at 6% p.a. simple interest. If she paid back \$2400 in interest, find how many years it took to repay the loan.

- 2** Is (1, 3) the point of intersection of  $y = x + 3$  and  $y = 3x$ ?

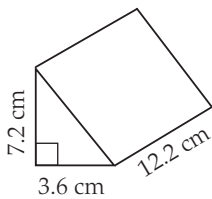
- 3** Write 5650 in scientific notation.

- 4** Expand  $-2(7y - 4)$ .

- 5** Factorise  $30x^2y - 24xy^2$ .

- 6** Factorise:  
 $x(x + 15) - 2(x + 15)$

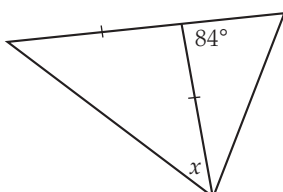
- 7** Find the volume of the following solid.



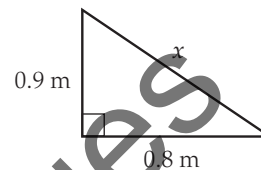

- 8** Name the 3D shape that has a square base with rectangular sides.

- 9** To go from (4, -2) to (2, -1), how many units right/left and up/down would you move?

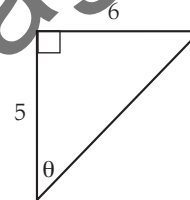
- 10** Find the value of the pronumeral in this diagram.




- 11** Find the unknown side length in this triangle, correct to 2 decimal places.




- 12** Which trigonometric ratio would you use to find  $\theta$ ?




- 13** Substitute  $(h, k) = (1, 3)$ ,  $x = 3$  and  $m = 0.5$  into  $y = m(x^2 - h) + k$  to find  $y$ .

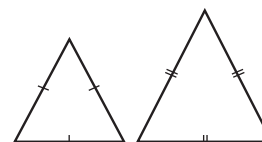
- 14** Simplify  $4(x + 3) + 2(x - 1)$  by first expanding.

- 15** Solve  $3(x - 4) = 12$ .

- 16** Five blocks of land are sold for the following prices. What is the median price?

\$590 000, \$720 000,  
\$480 000, \$570 000,  
\$620 000

- 17** Are these shapes congruent, similar or neither?




Skills  
1C mark:  
/17

Show all your  
working

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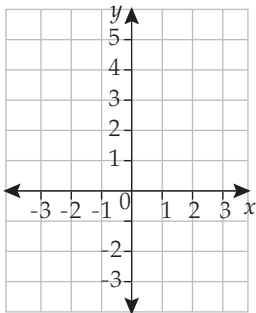
1 Represent  $-3 \leq x \leq 1$  on a number line.

2 Solve  $2x + 5 < 21$  for  $x$ .

3 Solve  $18 - 4y \geq 22$  for  $y$ .

4 Solve  $2y + 5 \leq 4y + 12$  for  $y$ .

5 Sketch  $y = 4$  and  $y = 3x + 1$  and hence find the point of intersection of the lines.



6 Solve these simultaneous equations using the elimination method.

$$2x + y = 5$$

$$2x - y = 3$$

7 Solve these simultaneous equations using the elimination method.

$$2x + 3y = 1$$

$$4x + 2y = 6$$

8 Solve these simultaneous equations using the substitution method.

$$y = 3x + 1$$

$$5x + 2y = 13$$

Practice  
1C mark:  
18