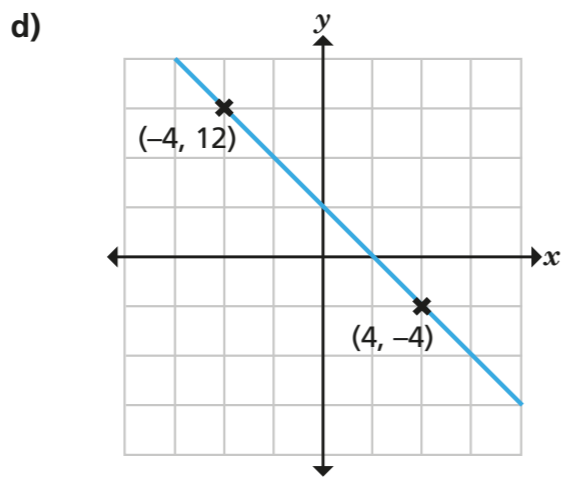
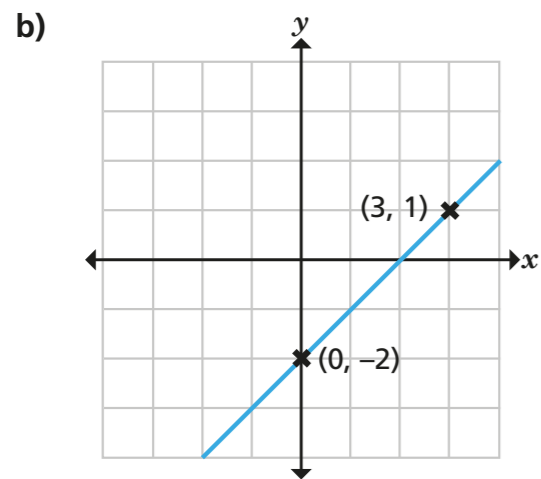
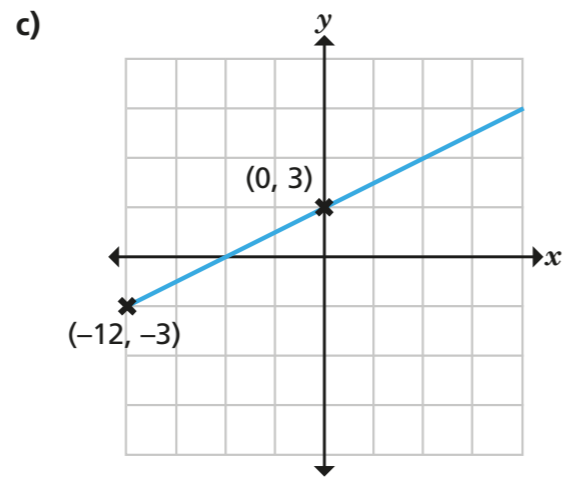
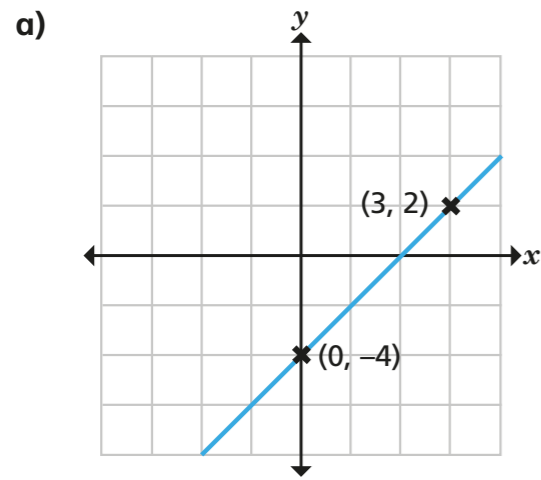


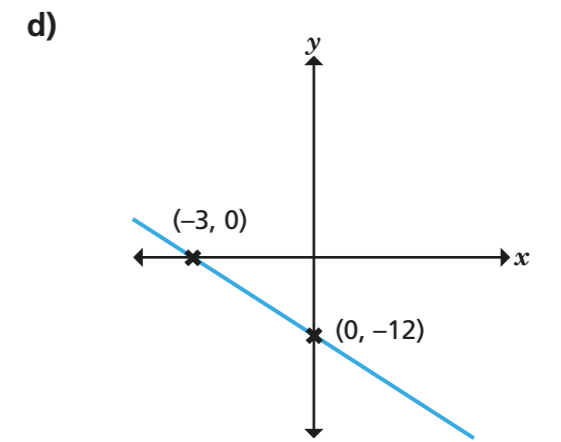
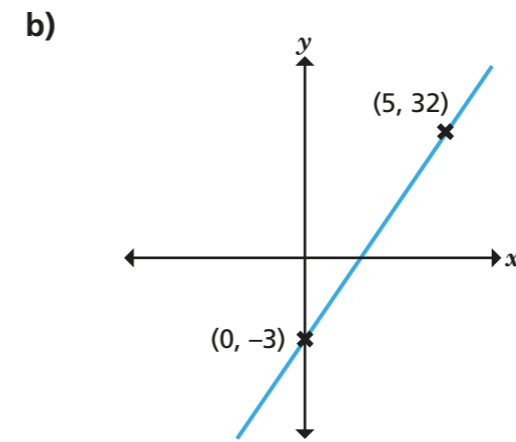
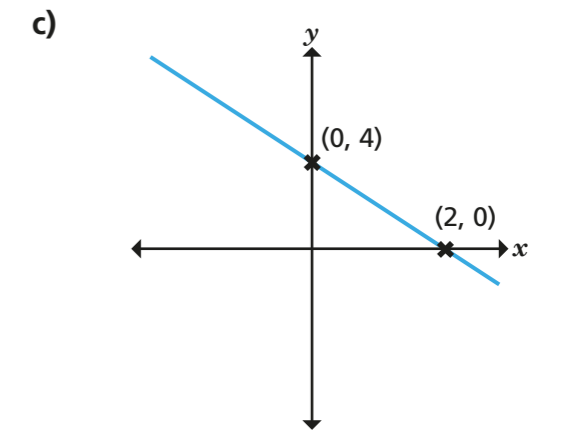
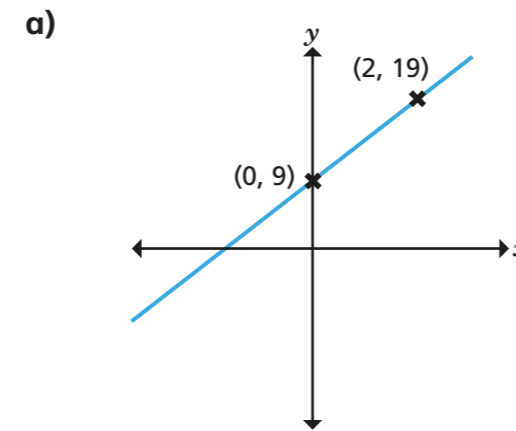
# Equation of a straight-line graph given two points

**1** Work out the equations of the straight lines. Show each stage of your workings clearly.



Compare methods with a partner.

**2** Work out the equations of the straight lines. Show each stage of your workings clearly.



**3** Mo and Alex are working out the equation of the straight line that passes through the points (0, 4) and (3, 10). Here are their workings.

**Mo**

A coordinate grid with x and y axes. A blue straight line is plotted, passing through the points (0, 4) and (3, 10). A red dashed right-angled triangle is drawn between these two points, with a horizontal side of length 3 and a vertical side of length 6. The calculations are shown to the right of the graph.

$$y = mx + c$$

$$m = \frac{6}{3} = 2$$

$$c = 4$$

$$y = 2x + 4$$

**Alex**

$$y = mx + c$$

$$c = 4$$

$$m = \frac{\text{change in } y}{\text{change in } x} = \frac{10 - 4}{3 - 0} = \frac{6}{3} = 2$$

$$y = 2x + 4$$

Whose method do you prefer?  
Discuss it with a partner.

4 Work out the equations of the straight lines that pass through the pairs of points.

a) (0, 5) and (9, 14)

d) (0, 1.5) and (-6, 25.5)

b) (0, -1) and (5, 9)

e) (6, 5) and (0, 10)

c) (8, -29) and (0, 3)

f)  $(-30, 27\frac{7}{8})$  and  $(0, \frac{7}{8})$

5 Rosie has worked out the equation of the straight line passing through the points (1, 7) and (2, 5).

Here are her workings.

a) Substitute the values of  $x$  and  $y$  from the point (2, 5) to show that Rosie is incorrect.

$$y = mx + c$$

$$m = \frac{7-5}{2-1} = \frac{2}{1} = 2$$

$$y = 2x + c$$

When  $x = 1, y = 7$

$$7 = 2(1) + c$$

$$7 = 2 + c$$

$$c = 5 \quad y = 2x + 5$$

b) Explain Rosie's mistake.

c) Work out the correct equation of the line.

6 Work out the equations of the straight lines that pass through the pairs of points.

a) (1, 3) and (9, 19)

d) (42, -4) and (-20, 27)

b) (-1, -7) and (3, 13)

e) (12, -31) and (60, 9)

c) (6, -11) and (-4, 19)

f)  $(-6, 7\frac{1}{12})$  and  $(-8, 6\frac{1}{12})$

7 Work out the equation of the straight line that passes through the points (0,  $b$ ) and (18,  $b + 42$ ).

8 The vertices of a triangle are given by the coordinates (-5, 6), (3, 8) and (5, -2).

Work out the equations of the three straight lines that border the triangle.