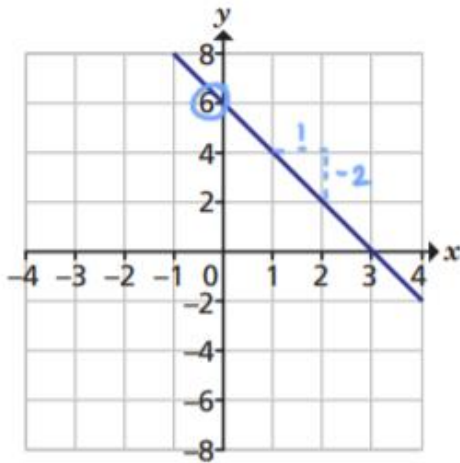


Year 10 Higher Answers - Straight Line Graphs

1.

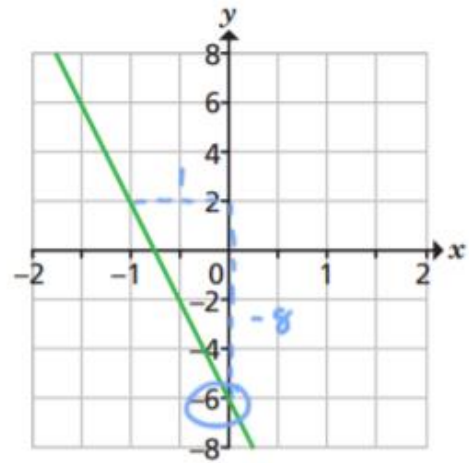
Work out the equations of each line.

a)



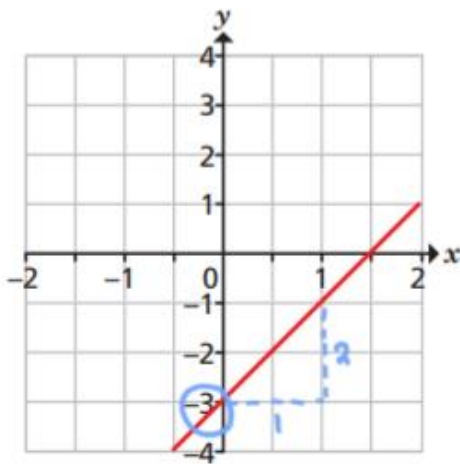
$$y = -2x + 6$$

c)



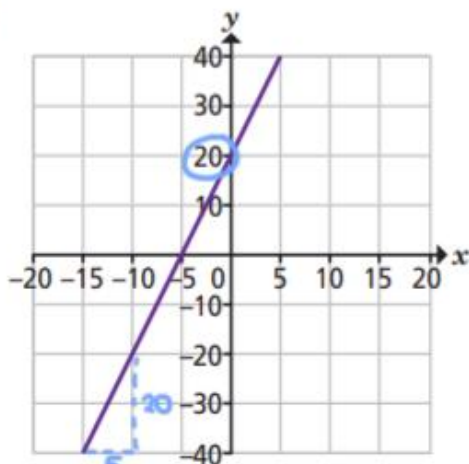
$$y = -8x - 6$$

b)



$$y = 2x - 3$$

d)



$$y = 4x + 20$$

2.

Write the negative reciprocal of each number.

a) $\frac{5}{3}$ $-\frac{3}{5}$

c) $\frac{4}{7}$ $-\frac{7}{4}$

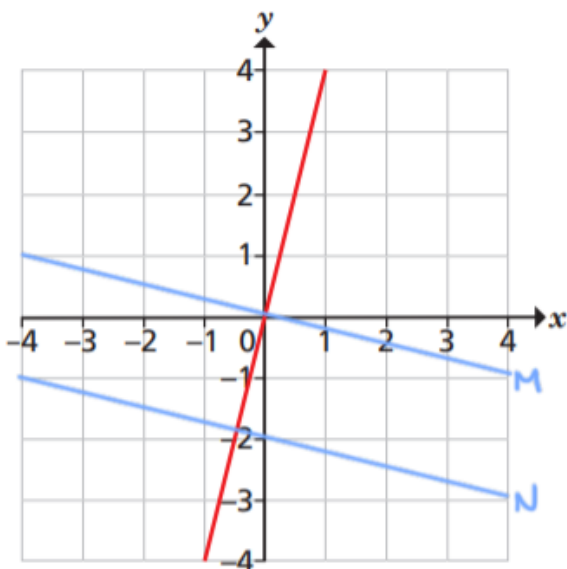
e) $-\frac{1}{14}$ 14

b) $-\frac{2}{5}$ $\frac{5}{2}$

d) 13 $-\frac{1}{13}$

f) -0.8 $\frac{5}{4}$

3. The graph of $y = 4x$ is shown on the grid.



a) What is the gradient of this line?

4

b) What is the gradient of a line perpendicular to this one?

$-\frac{1}{4}$

c) On the grid, draw the line that is perpendicular to $y = 4x$ and that passes through the origin. Label this line M.

What is the equation of line M?

$y = -\frac{1}{4}x$

d) On the same grid, draw the line that is perpendicular to $y = 4x$ and passes through the point $(0, -2)$. Label this line N.

What is the equation of line N?

$y = -\frac{1}{4}x - 2$

e) Are lines M and N perpendicular?

No

Explain your answer.

They are parallel.

**Even better answer – they are parallel as both gradients are equal to $-\frac{1}{4}$

4.

Write the equation of a line that is perpendicular to $y = 14x + 1$

e.g. $y = -\frac{1}{14}x$

**Your answer should be in the form $y = -\frac{1}{14}x + c$ where c is a constant (number)

5.

Write the equation of a line that is perpendicular to $y = 8 - 3x$ and that passes through the point $(0, 15)$.

$y = \frac{1}{3}x + 15$

6.

Two straight lines are given by these equations.

$$L_1 \quad y - 6x = 15$$

$$L_2 \quad 6y = 3 - x$$

Show that lines L_1 and L_2 are perpendicular.

$$L_1 \quad y = 6x + 15$$

$$m_1 = 6$$

$$L_2 \quad y = \frac{1}{2} - \frac{1}{6}x$$

$$m_2 = -\frac{1}{6}$$

$m_1 \times m_2 = -1$
therefore they
are perpendicular.

7.

Line A passes through the points $(2, 1)$ and $(5, 10)$
Find the equation of the line parallel to A that passes through $(2, 5)$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{10 - 1}{5 - 2} = \frac{9}{3} = \underline{\underline{3}}$$

$$y = 3x + c \quad \begin{matrix} (2, 5) \\ x \quad y \end{matrix}$$

$$5 = 3(2) + c$$

$$5 = 6 + c$$

$$c = \underline{\underline{-1}}$$

$$\underline{\underline{y = 3x - 1}}$$

8.

Line A passes through the points $(1, 5)$ and $(5, 7)$
Find the equation of the line perpendicular to A that passes through $(-1, 7)$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{7 - 5}{5 - 1} = \frac{2}{4} = \frac{1}{2}$$

perp. $m = -2$

$$y = -2x + c \quad (-1, 7)$$

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

$$7 = 2 + c$$

$$c = \underline{\underline{5}}$$

$$\underline{\underline{y = -2x + 5}}$$