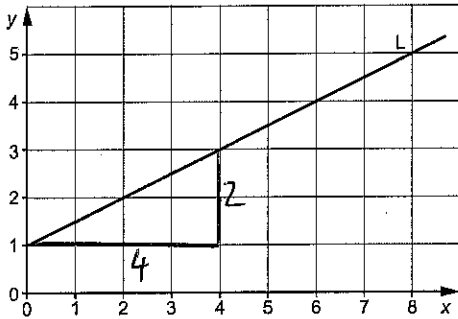


1. (a)



(i) Work out the gradient of straight line L.

..... gradient = $\frac{\text{distance up}}{\text{distance across}} = \frac{2}{4} = \frac{1}{2}$

Answer $\frac{1}{2}$ [2]

(ii) Write down the equation of line L.

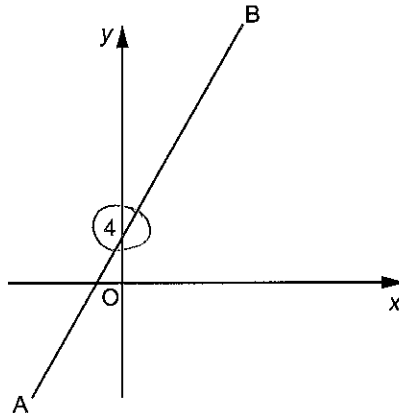
..... $y = \frac{1}{2}x + 1$ [2]

(b) The equation of another line is $y = 2x - 3$.
Is this line parallel to line L?
Explain your answer.

..... No, to be parallel they must have
the same gradient (they don't)

[1]

2. The straight line AB has gradient 3 and passes through the point (0, 4). y



(a) Write down the equation of the line AB.

.....
.....
..... $y = 3x + 4$

[2]

(b) Work out the equation of the straight line which passes through the point (6, 0) and is parallel to the line AB.

..... Parallel line \Rightarrow Same gradient

..... So $y = 3x + c$

when $x = 6, y = 0$ $y = 3x - 18$

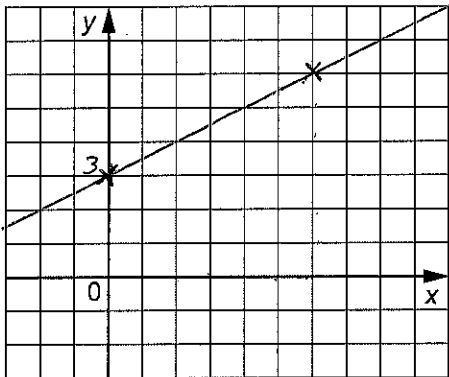
..... $0 = 18 + c$

..... $c = -18$

[2]

Equations of Straight Lines

3. You may find it helpful to use this grid.



(a) Find the equation of the line which passes through the points (0, 3) and (6, 6).

gradient = $\frac{6-3}{6-0} = \frac{3}{6} = \frac{1}{2}$

.....

.....

.....

$y = \frac{1}{2}x + 3$

[3]

(b) Find the equation of the line that is parallel to the line in part (a) and passes through the point (0, -1).

gradient = $\frac{1}{2}$, so $y = \frac{1}{2}x - 1$

.....

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

[2]

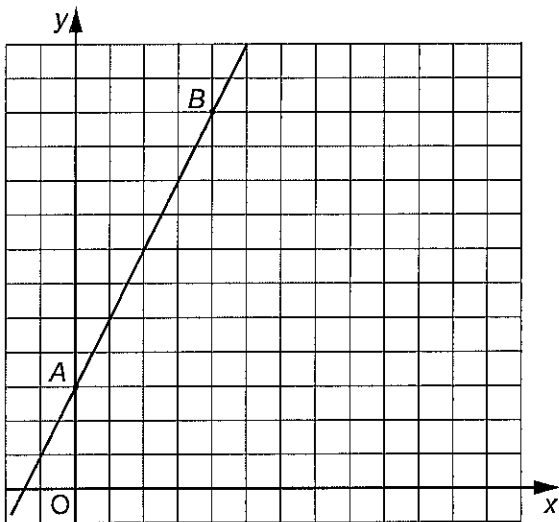
(c) Find the gradient of a line perpendicular to the line in part (a).

perpendicular gradient = $-\frac{1}{\text{original gradient}} = -\frac{2}{1} = -2$

.....

[1]

4.



A straight line is drawn through the points A (0, 3) and B (4, 11).

(a)

(i) Work out the gradient of AB.

gradient = $\frac{11-3}{4-0} = 2$

.....

.....

2

[2]

(ii) Write down the equation of the line AB.

$y = 2x + 3$

[1]

(b) Write down the equation of the line parallel to AB which passes through the point (0, 0).

.....

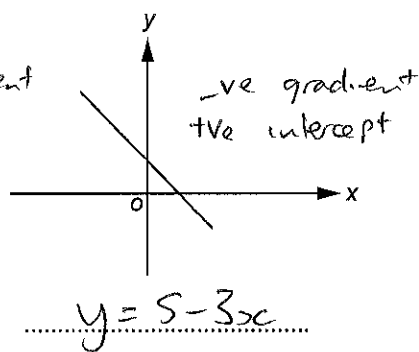
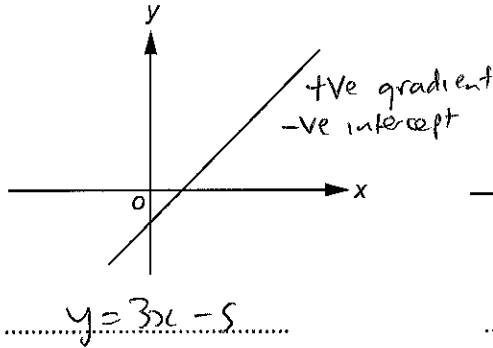
$y = 2x$

[1]

Equations of Straight Lines

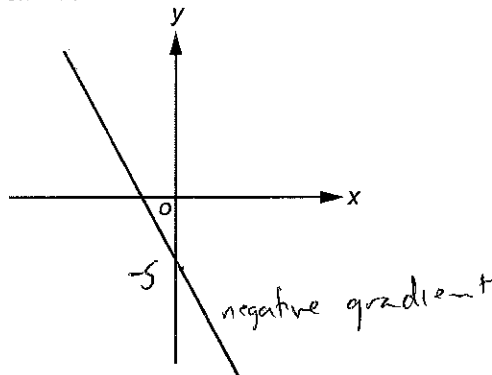
5. (a) Two graphs are sketched below.
Underneath each graph, write down its equation.
Choose the equation from the following list.

$y = 3x + 5$ $y = 5 - 3x$ $y = 3x - 5$ $5y = x + 3$



[2]

- (b) Sketch the graph of $y = -3x - 5$.



[2]

- (c) The graphs of the following equations are all straight lines.

$y = 5x + 3$

$3y = x - 5$

$3x + y = 5$

$y = 5 - 3x$

Which of these three lines is parallel to $y = -3x - 5$?

gradient = -3

gradient = 3

$3x + y = 5$

[1]

6. (a) Find the equation of the straight line through (0, 1) and (3, 7).

gradient = $\frac{7-1}{3-0} = 2$ ↑
intercept

$y = 2x + 1$

$y = 2x + 1$

[3]

- (b) Another line has equation $y = 7 - 2x$.

Without drawing the lines, explain how you can tell whether or not this line is perpendicular to the line in part (a).

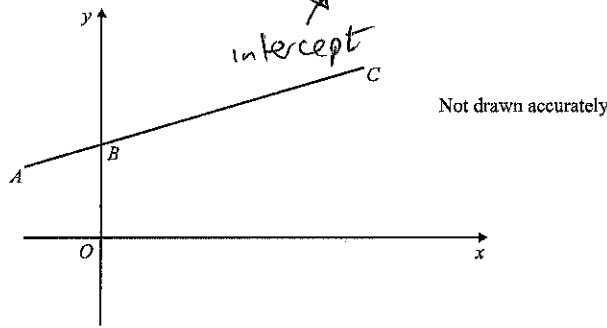
$y = 7 - 2x$

perpendicular gradient = $\frac{1}{2}$ (which is not the gradient above)

[2]
3

Equations of Straight Lines

7. The diagram shows the points A (-2, 2), B(0, 3) and C(8, 7).



Find the equation of the straight line which passes through A, B and C.

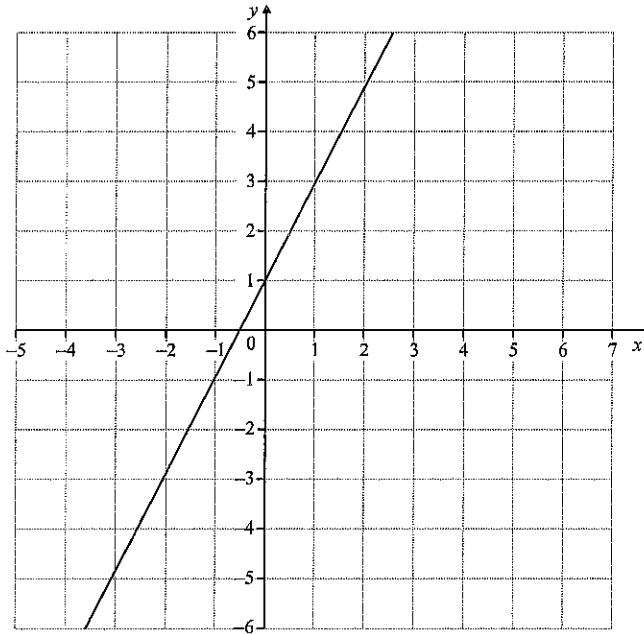
Choose any 2 points

$$\text{gradient} = \frac{7-3}{8-0} = \frac{1}{2}$$

Answer $y = \frac{1}{2}x + 3$

(Total 3 marks)

8. The diagram shows the graph of $y = 2x + 1$.



A line passes through the point (2, -3) and is perpendicular to $y = 2x + 1$.

The equation of this line can be written in the form $ax + by = c$.

What are the values of a, b and c?

perpendicular gradient = $-\frac{1}{2}$

$$y = -\frac{1}{2}x + c$$

Use the point (2, -3)

$$-3 = -\frac{1}{2} \times 2 + c$$

$$c = -2$$

$$\left. \begin{array}{l} \text{All} \\ \text{of these} \\ \text{are the} \\ \text{same} \\ \text{equation.} \end{array} \right\} \text{Answer } y = -\frac{1}{2}x - 2$$

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

$$x + 2y = -4$$

(Total 3 marks)

9. Find the equation of the straight line passing through the point (0, 5) which is perpendicular to the line

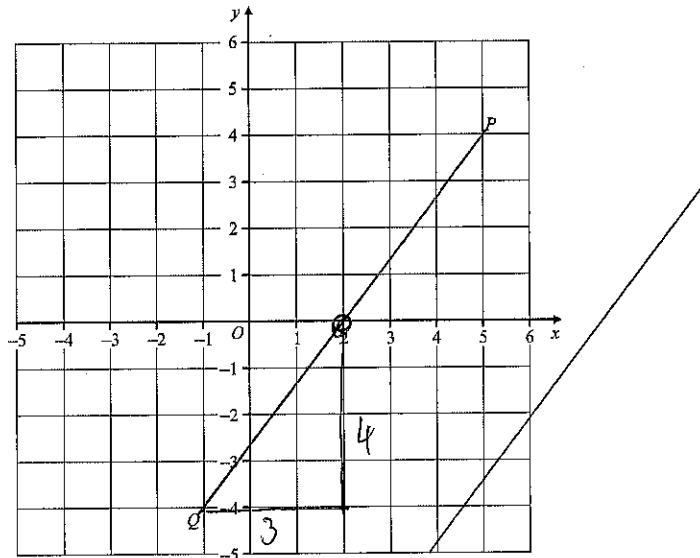
$$y = \frac{2}{3}x + 3$$

↑
Intercept

perpendicular gradient = $-\frac{3}{2}$

Answer $y = -\frac{3}{2}x + 5$ (Total 2 marks)

10. The line PQ is shown on the grid.



- (a) Find the gradient of a line which is perpendicular to PQ.

original gradient = $\frac{4}{3}$ perpendicular gradient = $-\frac{3}{4}$

Answer $-\frac{3}{4}$

(3)

- (b) Hence find the equation of the perpendicular bisector of the line PQ.

use (2,0) half way \rightarrow (2,0) is on the line

$$y = -\frac{3}{4}x + C$$

$0 = -\frac{3}{4} \times 2 + C$ Answer $y = -\frac{3}{4}x + \frac{3}{2}$

(2)
(Total 5 marks)

$$C = \frac{3}{2}$$