

Chapter 5 – Straight line graphs

? Example 1 – Work out gradient given two points

Work out the gradient of the line joining $(-2, 7)$ and $(4, 5)$

? Example 2 – Calculations with gradients

The line joining $(2, -5)$ to $(4, a)$ has gradient -1 . Work out the value of a .

? Example 3 – Alternative forms of straight-line equations

Write down the gradient and y-intercept of these lines:

a. $y = -3x + 2$ b. $4x - 3y + 5 = 0$

? Example 4 – Alternative forms of straight-line equations

Write these lines in the form $ax + by + c = 0$

a. $y = 4x + 3$ b. $y = -\frac{1}{2}x + 5$

? Example 5 – Intersections with axes

The line $y = 4x - 8$ meets the x -axis at the point P .

Work out the coordinates of P .

? Example 6 – Finding the equation of a straight line

Find the equation of the line with gradient 5 that passes through the point $(3, 2)$.

? Example 7 – Finding the equation of a straight line

Find the equation of the line that passes through the points $(5, 7)$ and $(3, -1)$.

? Example 8 – Finding the equation of a straight line

The line $y = 3x - 9$ meets the x -axis at the point A . Find the equation of the line with gradient $\frac{2}{3}$ that passes through point A . Write your answer in the form $ax + by + c = 0$, where a , b and c are integers.

? Example 9 – Finding the equation of a straight line

The lines $y = 4x - 7$ and $2x + 3y - 21 = 0$ intersect at the point A . The point B has coordinates $(-2, 8)$. Find the equation of the line that passes through the points A and B . Write your answer in the form $ax + by + c = 0$, where a , b and c are integers.

? Example 10 – Equations of perpendicular lines

A line is parallel to the line $6x + 3y - 2 = 0$ and it passes through the point $(0, 3)$. Work out the equation of the line.

? Example 11 – Testing for perpendicularity or parallelism

Work out whether these pairs of lines are parallel, perpendicular or neither:

a. $3x - y - 2 = 0$ b. $y = \frac{1}{2}x$
 $x + 3y - 6 = 0$ $2x - y + 4 = 0$

? Example 12 – Finding the equations of perpendicular lines

A line is perpendicular to the line $2y - x - 8 = 0$ and passes through the point $(5, -7)$.

Find the equation of the line.

? Example 13 – Working out the distance between two points

Find the distance between $(2, 3)$ and $(5, 7)$.

? Example 14 – Working out distances and areas

The straight line l_1 with equation $4x - y = 0$ and the straight line l_2 with equation $2x + 3y - 21 = 0$ intersect at point A .

- Work out the coordinates of A .
- Work out the area of triangle AOB where B is the point where l_2 meets the x -axis.

? Example 15 – Modelling using straight line graphs

The graph shows the extension, E , of a spring when different masses, m , are attached to the end of the spring.

- Calculate the gradient, k , of the line.
- Write an equation linking E and m .
- Explain what the value of k represents in this situation.

