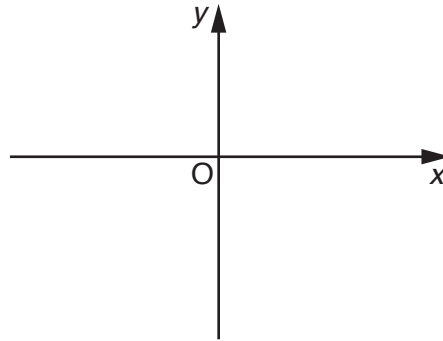


1 A line  $L$  passes through the points  $(8, 0)$  and  $(0, -4)$ .

(a) Sketch line  $L$ .



[1]

(b) Calculate the gradient of line  $L$ .

(b) ..... [2]

(c) Line  $M$  is parallel to line  $L$  and passes through the point  $(0, 6)$ .

Write down the equation of line  $M$ .

(c) ..... [2]

(d) Line  $N$  has the equation  $y = 2x - 3$ .

Is line  $N$

- parallel to line  $L$  or
- perpendicular to line  $L$  or
- neither parallel nor perpendicular to line  $L$ ?

Justify your choice.

.....

.....

..... [3]

2 A straight line has gradient 6 and passes through the point (0, -5).

Write down the equation of the line.

\_\_\_\_\_ [2]

- 3 (a) The sketches of three different straight line graphs are shown below.

Write the correct equation under each sketch. Choose from this list.

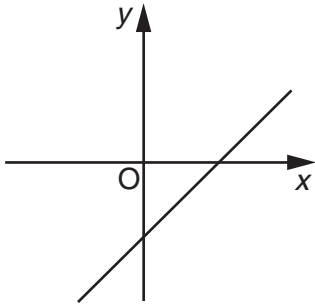
$$y = \frac{1}{2}x + 5$$

$$y = -3x + 5$$

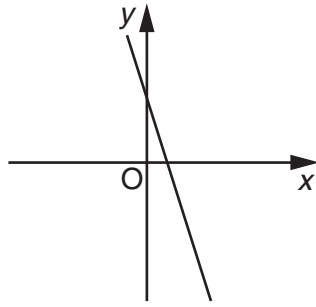
$$y = x^2 + 5$$

$$y = x - 5$$

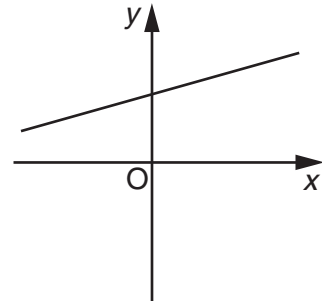
$$y = -3x - 5$$



\_\_\_\_\_



\_\_\_\_\_



[3]

- (b) A line,  $L$ , is **perpendicular** to the line  $y = 2x + 6$ .  
 $L$  goes through the point  $(0, 3)$ .

Find the equation of the line  $L$ .

(b) \_\_\_\_\_ [2]

4 A line,  $L$ , has equation  $y = 4x - 5$ .

(a) Write down the gradient of line  $L$ .

(a) ..... [1]

(b) What are the coordinates of the point where line  $L$  crosses the  $y$ -axis?

(b) (....., .....) [1]

(c) Write down the equation of the line **parallel** to line  $L$  that passes through  $(0, 0)$ .

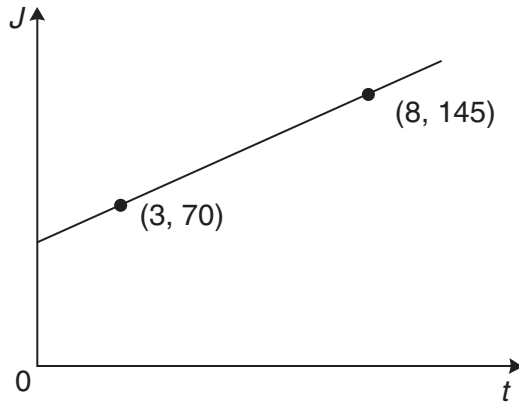
(c) ..... [2]

(d) Explain how you can tell that the line  $y = -\frac{1}{5}x - 5$  is not perpendicular to line  $L$ .

.....  
..... [1]

- 5 This graph shows how much a gardener charges for jobs taking different lengths of time.

$J$  is the charge, in £, for a job and  $t$  is the number of hours the job takes.  
For a job that lasts 3 hours, the charge is £70.  
For a job that lasts 8 hours, the charge is £145.



Not to scale

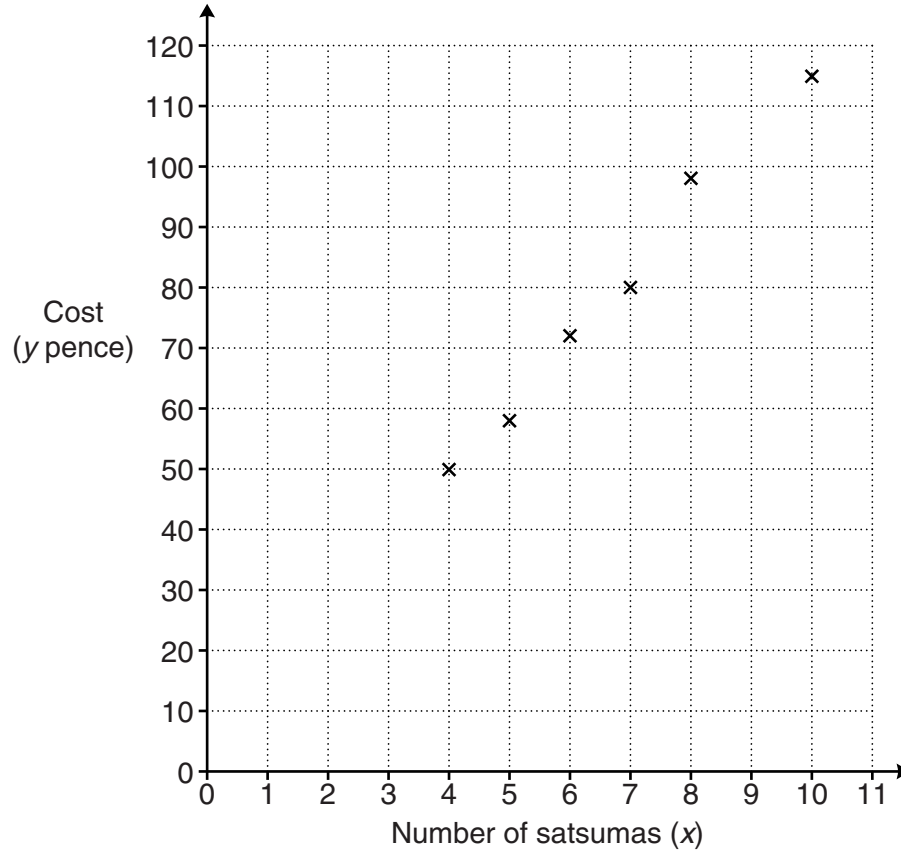
- (a) Find the gradient of the line.

(a) \_\_\_\_\_ [2]

- (b) Work out the equation of the line to give a formula for  $J$  in terms of  $t$ .

(b) \_\_\_\_\_ [3]

- 6 Wibke buys satsumas from the market each week. She keeps a record of how many satsumas she gets and how much they cost her. She plots this information on a grid.



(a) Draw a line of best fit. [1]

(b) Calculate the gradient of your line.  
Give your answer to the nearest whole number.

(b) \_\_\_\_\_ [2]

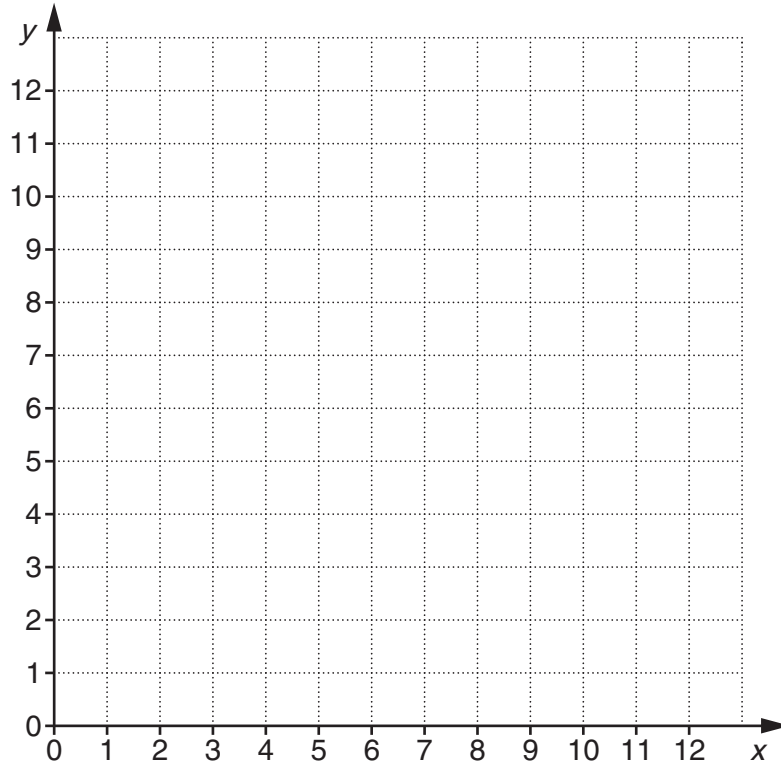
(c) What information about satsumas does the gradient represent?

(c) \_\_\_\_\_ [1]

(d) Write down the equation of your line in terms of  $y$  and  $x$ .

(d) \_\_\_\_\_ [2]

- 7 (a) Draw the straight line through (0, 8) and (12, 0).



[1]

- (b) Work out the gradient of your line.  
Give your answer as a fraction in its simplest form.

(b) \_\_\_\_\_ [2]

- (c) Write down the equation of your line in the form  $y = mx + c$ .

(c) \_\_\_\_\_ [2]

- (d) Work out the **gradient** of a line **perpendicular** to your line.

(d) \_\_\_\_\_ [1]

- 8 Harpreet is doing an experiment.  
She attaches different weights to the end of a spring  
and then measures the length of the spring.

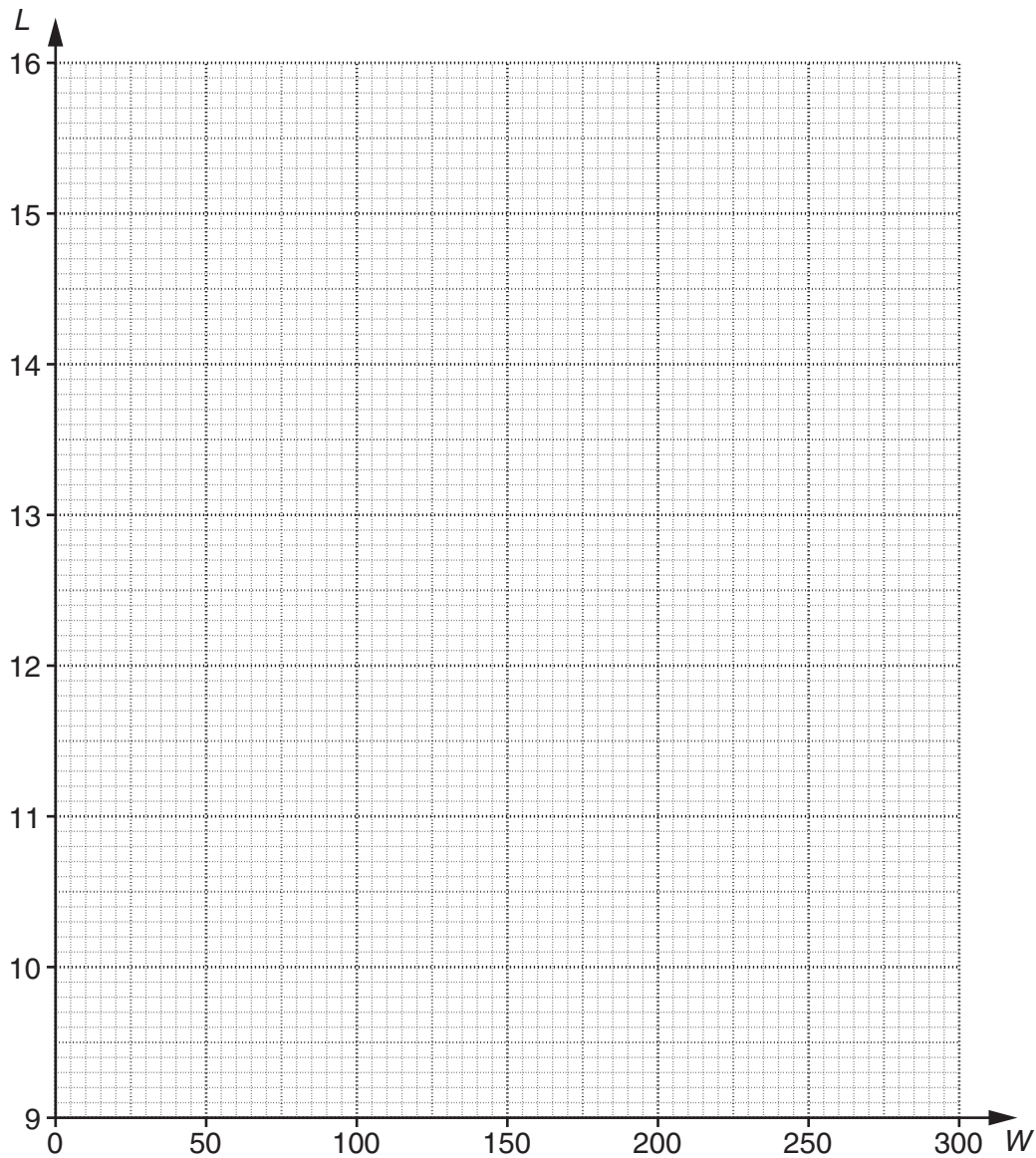


She records the length,  $L$  cm, of the spring for each weight,  $W$ g.

Her results are given in the table.

$W$	50	80	120	200	260
$L$	11	11.6	12.4	14	15.2

- (a) Use these values to draw the straight line graph of  $L$  against  $W$ .



[3]



(b) How long was the spring before Harpreet attached any weight to it?

(b) \_\_\_\_\_ cm [1]

(c) Calculate the gradient of the graph in part (a).

(c) \_\_\_\_\_ [2]

(d) Write down the equation of your graph in the form  $L = mW + c$ .

(d) \_\_\_\_\_ [1]

(e) Harpreet says that she can use the equation in part (d) to calculate the length of the spring if she attaches a 5 kg weight to it.

Explain why she may be wrong.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [1]

9 (a) Find the coordinates of the midpoint of the line joining the points (5, 2) and (-3, 7).

(a) ( ..... , ..... ) [2]

(b) (i) For  $d = 6t^2 + 4$ , find the value of  $d$  when  $t = -3$ .

(b)(i) ..... [2]

(ii) Rearrange this formula to make  $t$  the subject.

$$d = 6t^2 + 4$$

(ii) ..... [3]

(c) Write a **number** in each box so that the following is an identity.

$$4x - 3 + 6(x - 5) \equiv 7x - 1 + \square x - \square \quad [2]$$

(d) You are given that  $f(x) = 5 - 2x$ .

(i) Find  $x$  when  $f(x) = 0$ .

(d)(i) ..... [1]

(ii) Find  $f(t + 4)$ .  
Express your answer in the form  $a + bt$ .

(ii) ..... [2]