




# COUNTDOWN TO YOUR FINAL MATHS EXAM ...

## PART 8 (2018)



	Marks	Actual	  
Q1. Scatter graphs (Clip 30)	5		
Q2. Real life graphs (Clip 38)	4		
Q3. Real life graphs (Clip 38)	5		
Q4. Conversion graphs	3		
Q5. Straight line graphs (Clip 32)	3		
Q6. Real life graphs (Clip 38)	4		
Q7. Quadratic & cubic graphs (Clip 33)	3		
Q8. Scatter graphs (Clip 30)	3		
Q9. Coordinate Geometry (Clip 34/45)	2		
Q10. Real life graphs (Clip 38)	3		
Q11. Coordinate Geometry (Clip 34/45)	4		
Q12. Coordinate Geometry (Clip 34/45)	5		
Q13. Straight line graphs (Clip 32)	4		
Q14. Quadratic & cubic graphs (Clip 33)	6		
Q15. Real life graphs (Clip 38)	2		
Q16. Real life graphs (Clip 38)	3		

59



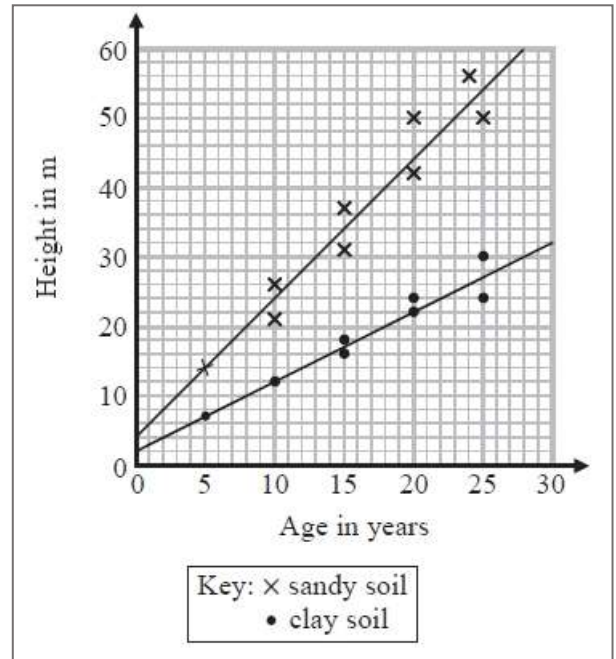
## Questions

**Q1.** Bill wants to compare the heights of pine trees growing in sandy soil with the heights of pine trees growing in clay soil.

The scatter diagram gives some information about the heights and the ages of some pine trees.

(a) Describe the relationship between the height of pine trees and the age of pine trees growing in sandy soil.

(1)



A pine tree growing in clay soil is 18 years old.

(b) Find an estimate for the height of this tree.

(1)

A pine tree is growing in sandy soil.

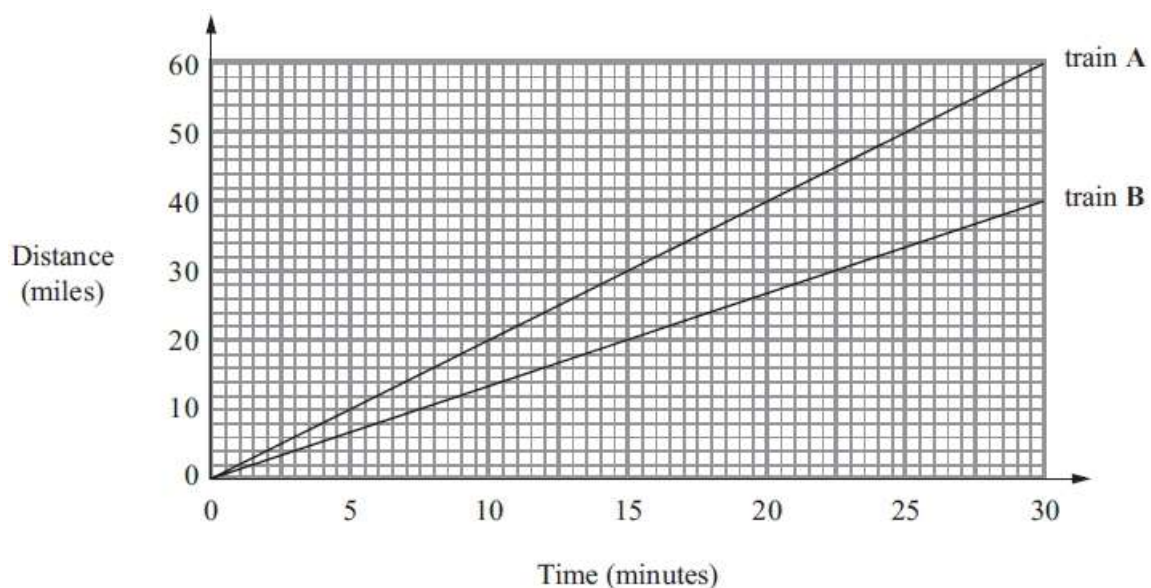
(c) Work out an estimate for how much the height of this tree increases in a year.

(2)

(d) Compare the rate of increase of the height of trees growing in clay soil with the rate of increase of the height of trees growing in sandy soil.

(2)

**Q2.** The graph shows the distance travelled by two trains.



(a) Work out the gradient of the line for train **A**.

(2)

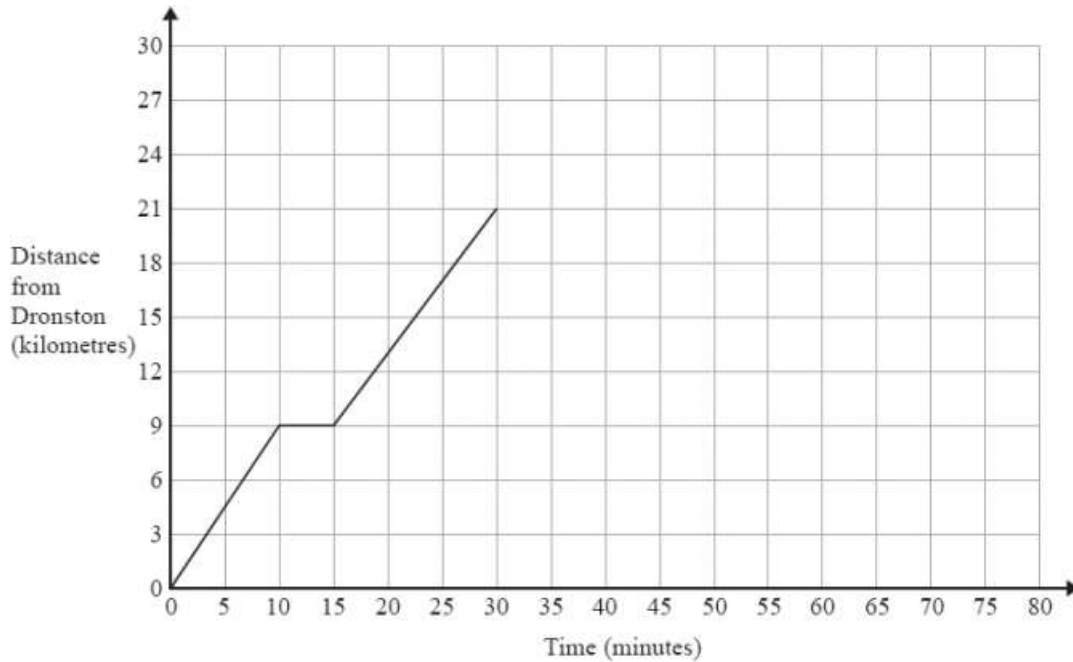
(b) Which train is travelling at the greater speed? You must explain your answer.

(1)

(c) After how many minutes has train **A** gone 10 miles further than train **B**?

(1)

**Q3.** A coach travels from Dronston to Luscoe. The travel graph for this journey is shown below.



(a) Work out the average speed of the coach, in kilometres per hour, for the first 10 minutes of the journey.

(2)

The coach stops in Luscoe for 15 minutes. The coach then returns to Dronston at a constant speed of 42km/h.

(b) Show this information on the travel graph.

(3)

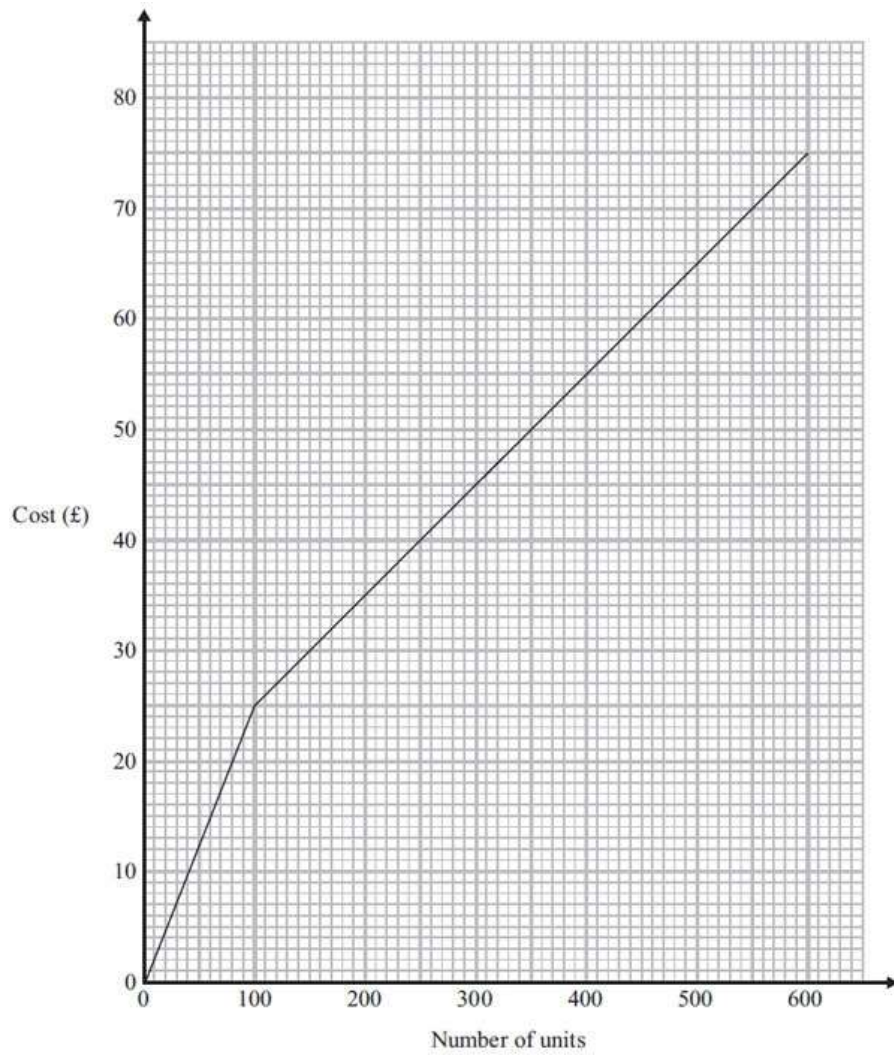
**Q4.** You can use the graph opposite to find out how much Lethna has to pay for the units of electricity she has used.

Lethna pays at one rate for the first 100 units of electricity she uses.

She pays at a different rate for all the other units of electricity she uses.

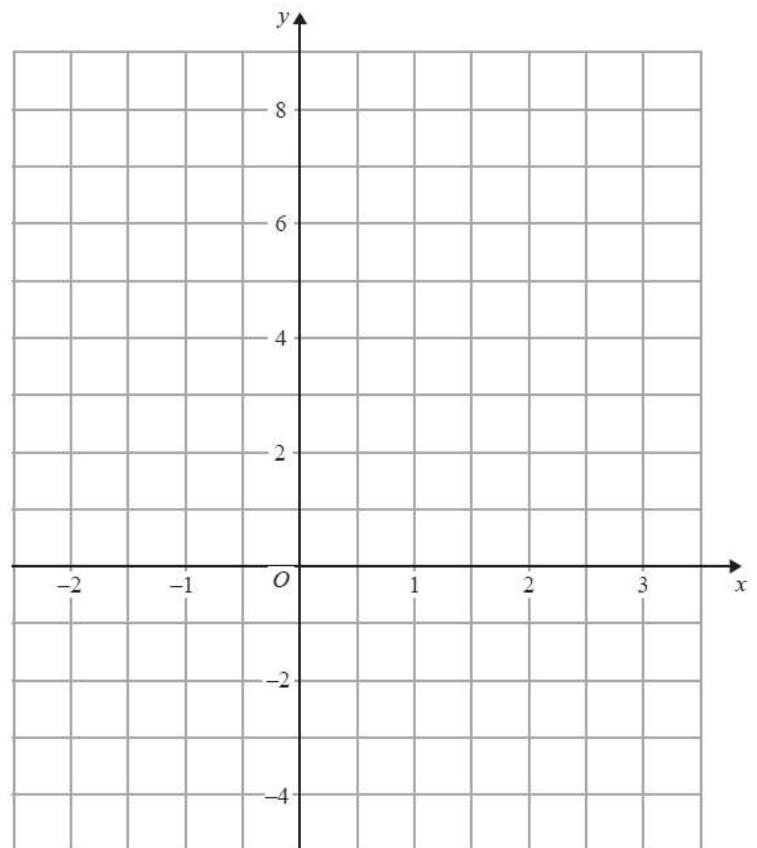
Lethna uses a total of 900 units of electricity.

Work out how much she must pay.



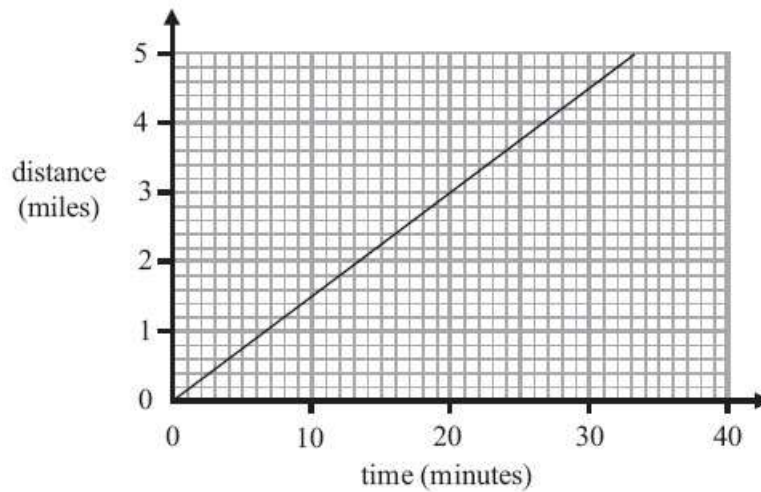
(3)

**Q5.** On the grid, draw the graph of  
 $y = 3 - 2x$  for values of  $x$  from  $-2$  to  $3$



(3)

**Q6.** Lisa cycles to work. The travel graph shows information about her journey to work on Tuesday.



Martin also cycles to work.  
On Tuesday his average speed was 16 km per hour.

Who has the greater average speed, Lisa or Martin?  
You must show all your working.

**(4)**

**Q7.** Here are three graphs.

Here are four equations of graphs.

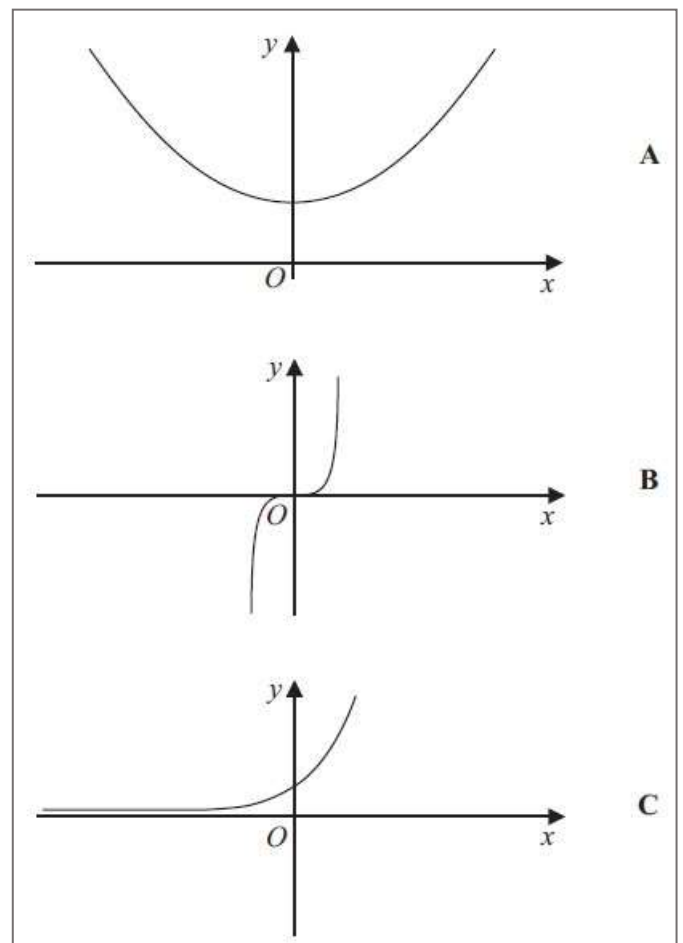
$y = x^3$        $y = x^2 + 4$        $y = 1/x$        $y = 2^x$

Match each to the correct equation.

**A** and  $y =$  .....

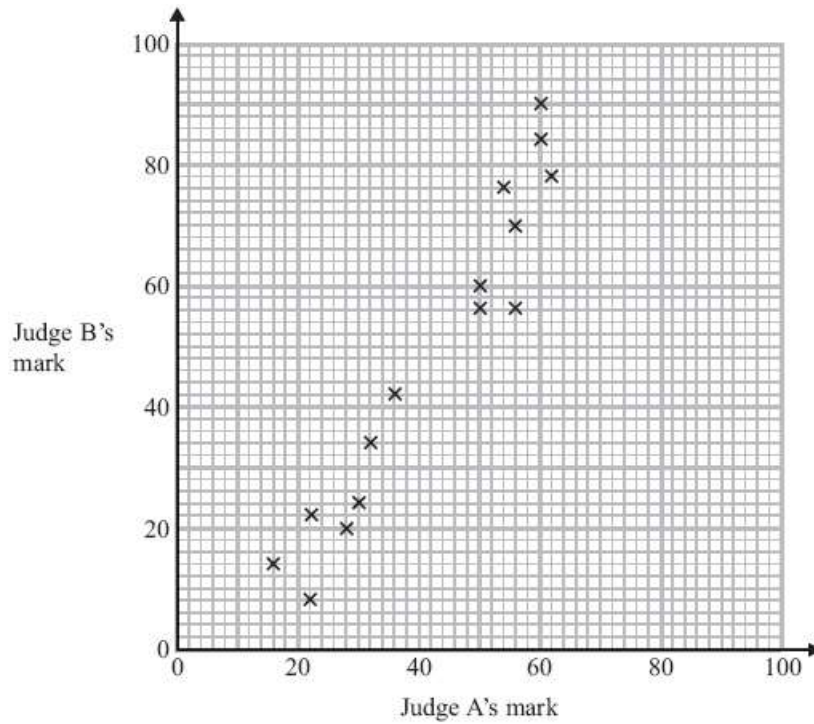
**B** and  $y =$  .....

**C** and  $y =$  .....



**(3)**

**Q8.** Some children took part in a piano competition. Each child was given a mark from Judge A and from Judge B. The scatter graph below shows some of this information.



(a) Describe the correlation.

**(1)**

Judge A gives 44 marks to another child.

(b) Use the scatter graph to estimate Judge B's mark for this child.

**(2)**

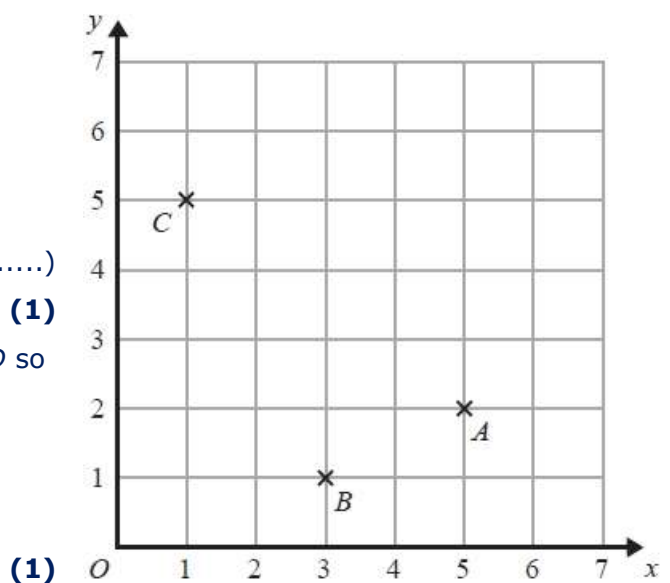
**Q9.**

(a) Write down the coordinates of point C.

(....., .....) (1)

(b) On the grid, mark with a cross (×) the point D so that ABCD is a rectangle.

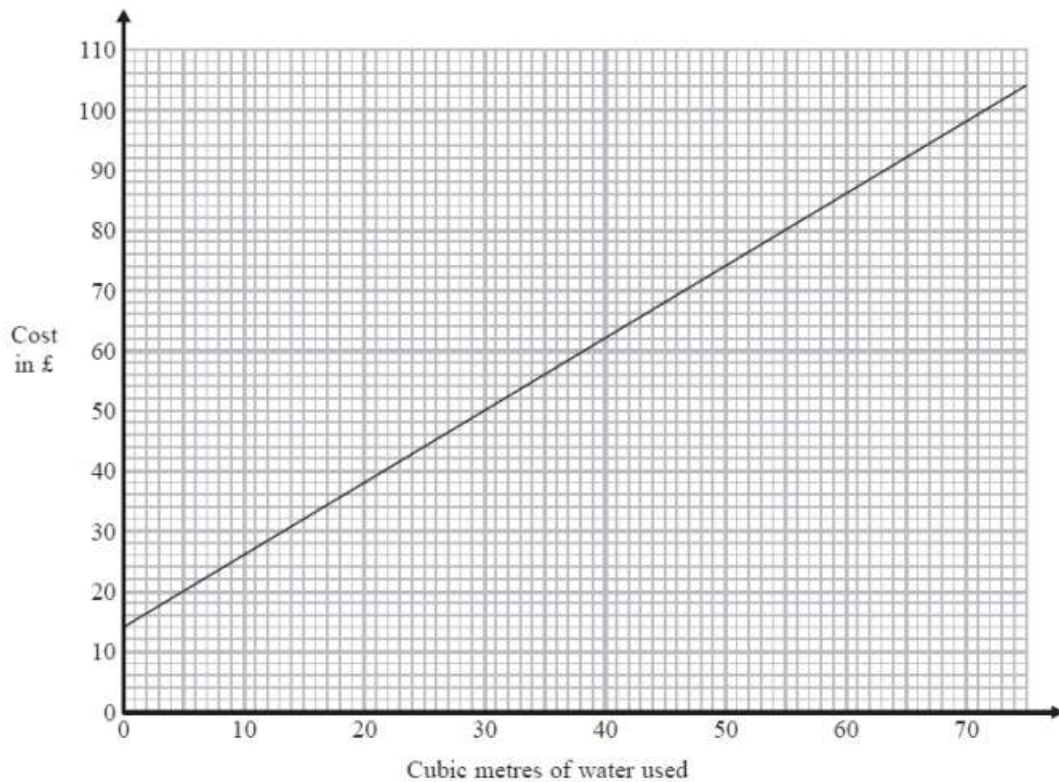
Label this point D.



**(1)**

**Q10.** A water company charges customers a fixed standing charge plus an additional cost for the amount of water, in cubic metres, used.

The graph shows information about the total cost charged.



(a) Write down the fixed standing charge.

(1)

(b) Work out the additional cost for each cubic metre of water used.

(2)

**Q11.**

In the diagram

$A$  is the point  $(0, 4)$

$B$  is the point  $(6, 0)$

$M$  is the midpoint of  $AB$ .

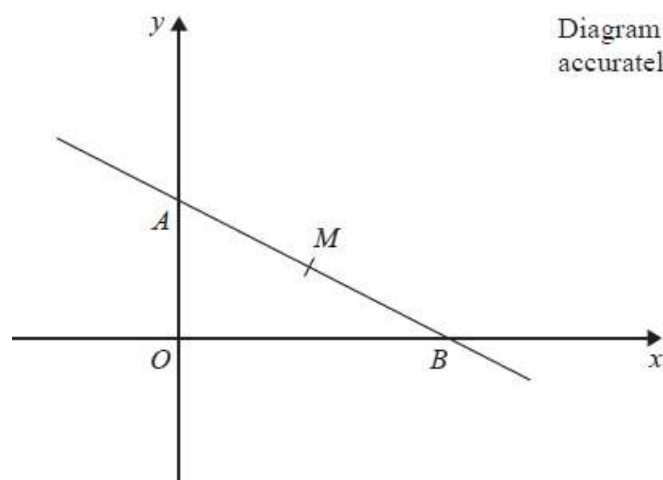


Diagram NOT accurately drawn

Find an equation of the line that passes through  $M$  and is perpendicular to  $AB$ .

(4)

**Q12.**  $A$  and  $B$  are two points.

Point  $A$  has coordinates  $(-2, 4)$ .

Point  $B$  has coordinates  $(8, 9)$ .

$C$  is the midpoint of the line segment  $AB$ .

(a) Find the coordinates of  $C$ .

**(2)**

$D$  is the point with coordinates  $(100, 56)$ .

(b) Does point  $D$  lie on the straight line that passes through  $A$  and  $B$ ? You must show how you work out your answer.

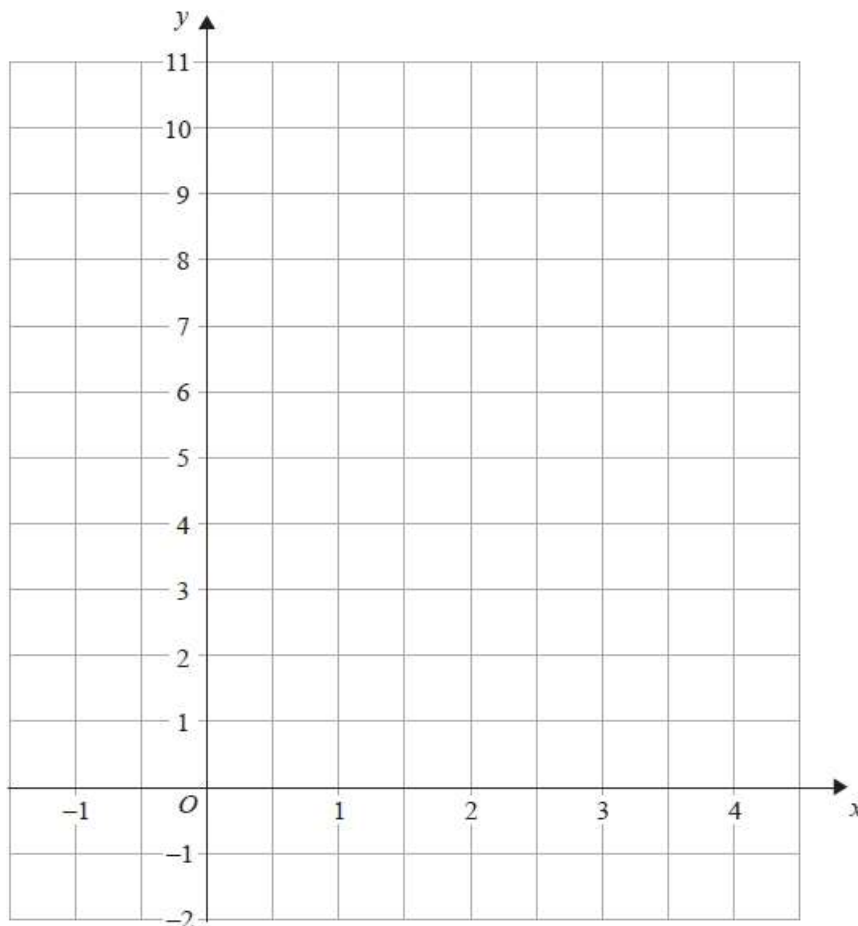
**(3)**

**Q13.** (a) Complete the table of values for  $y = 8 - 2x$

$x$	-1	0	1	2	3	4
$y$			6			0

**(2)**

(b) On the grid, draw the graph of  $y = 8 - 2x$  for values of  $x$  from  $-1$  to  $4$



**(2)**

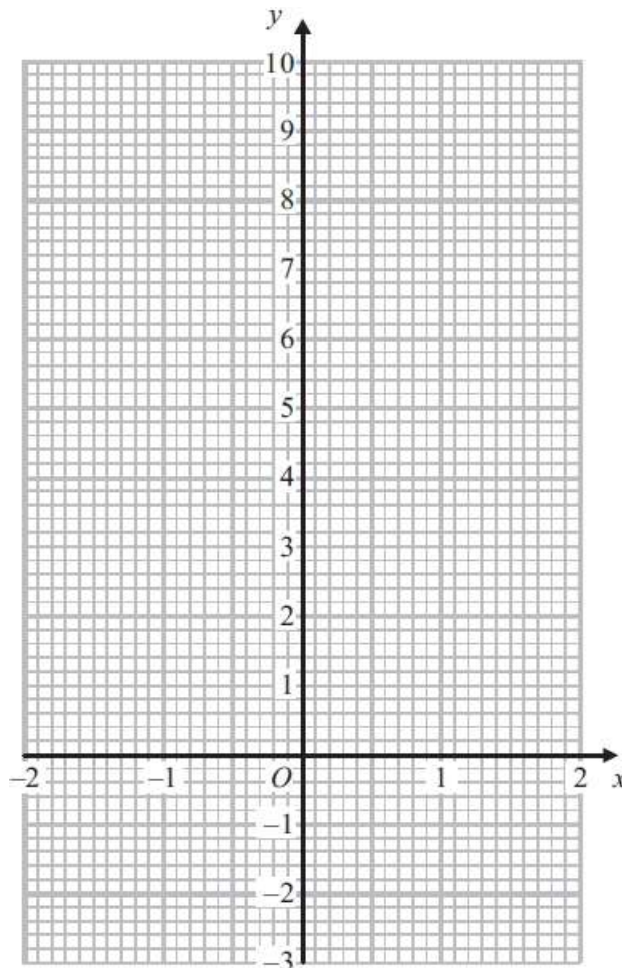


**Q14.** (a) Complete the table of values for  $y = 2x^2 - 1$

$x$	-2	-1	0	1	2
$y$	7			1	

(2)

(b) On the grid below, draw the graph of  $y = 2x^2 - 1$  for values of  $x$  from  $x = -2$  to  $x = 2$



(2)

(c) Use your graph to write down estimates of the solutions of the equation  $2x^2 - 1 = 0$

(2)

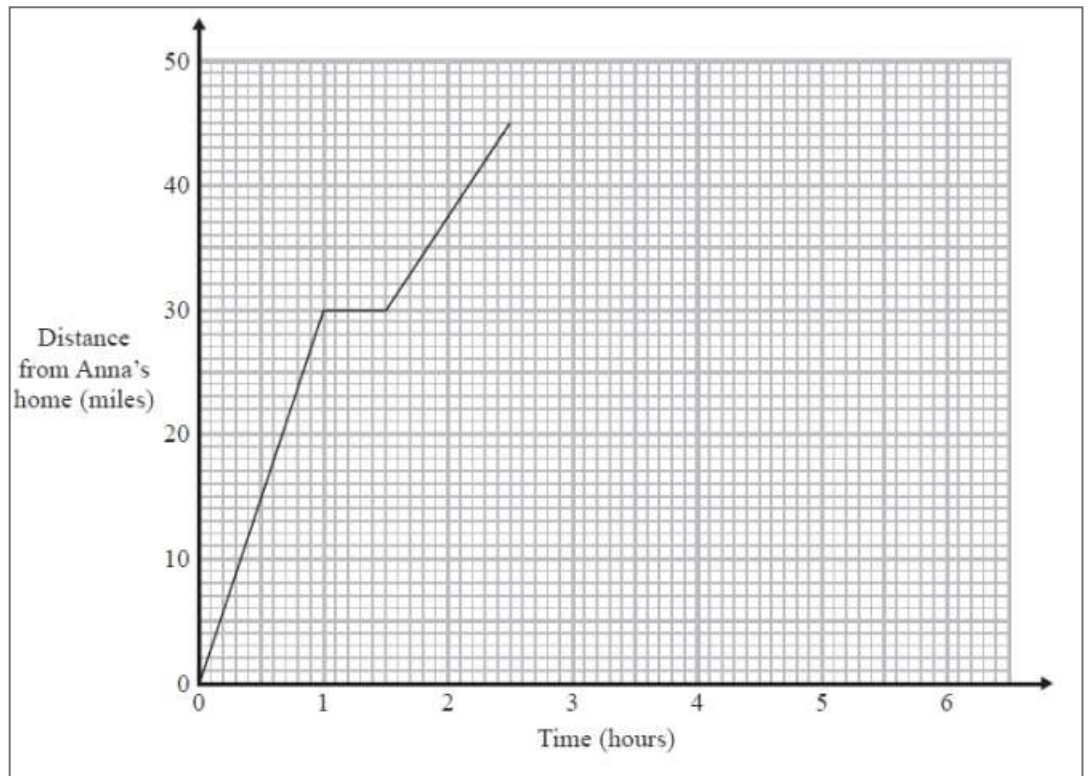
**(Total for Question is 6 marks)**

**Q15.** Anna drives 45 miles from her home to a meeting.

Here is the travel graph for Anna's journey to the meeting.

Anna's meeting lasts for 1 hour.

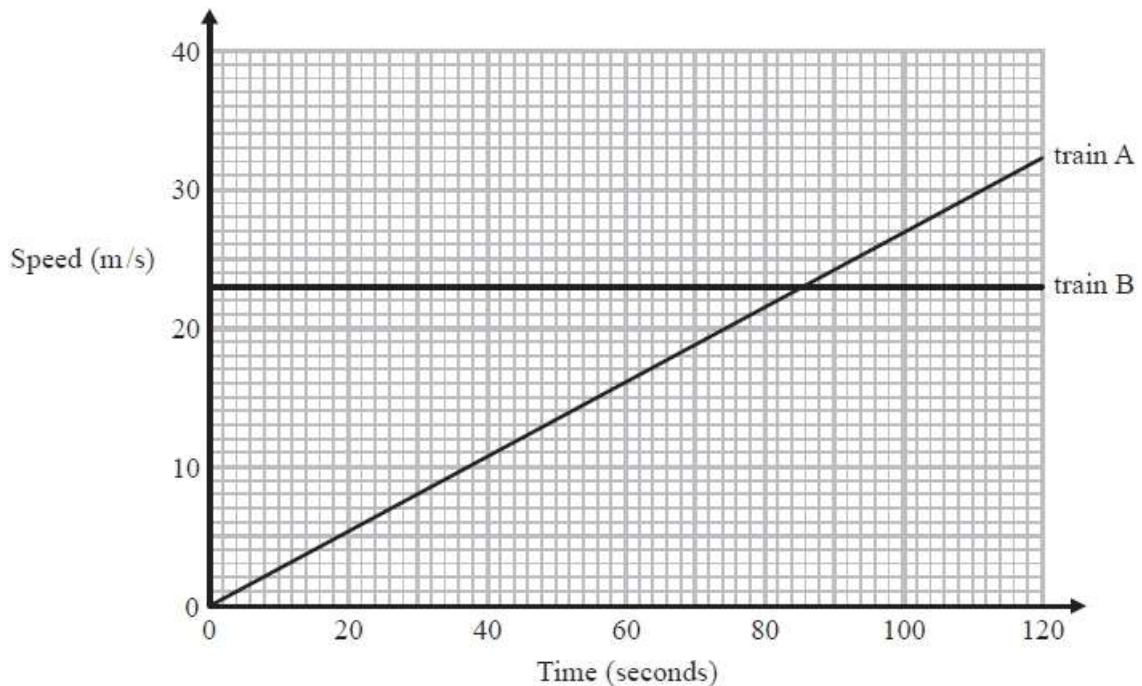
She then drives home at a steady speed of 30 miles per hour with no stops.



Complete the travel graph to show this information.

**(2)**

**Q16.** The graph shows information about the speeds of two trains.



(a) Work out the gradient of the line for train A.

**(2)**

(b) Describe how the speed of train A and the speed of train B are changing in relation to time.

**(1)**