Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel Award

Wednesday 10 May 2023

Morning (Time: 1 hour 30 minutes)

Paper reference **AAL20/01**

Algebra

Level 2

Calculator NOT allowed

You must have:
Ruler graduated in centimetres and millimetres, pen, HB pencil, eraser.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators are not allowed.**

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

P70978A

N:1/1/1/1/1/1/

P 7 0 9 7 8 A 0 1 2 0

Pearson

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

You must NOT use a calculator.

1 (a) Simplify $m + m + 3m + m^2$

.....

(1)

(b) Simplify $(x^4)^2$

.....

(1)

(c) Simplify $p^7 \div p^4$

.....

(1)

(d) Simplify $\dfrac{15qr^3}{5r^2}$

.....

(2)

(Total for Question 1 is 5 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

2 Craig buys h hooks.

He uses 35 of these hooks.

(a) Write down an expression, in terms of h, for the number of these hooks Craig does not use.

.....

(1)

Nails are sold in packets of 50 nails and boxes of 200 nails.

Andy buys x packets of nails and y boxes of nails.

(b) Write down an expression, in terms of x and y, for the total number of nails Andy buys.

.....

(2)

(Total for Question 2 is 3 marks)

3 (a) Factorise $5c^2 + cd$

.....

(1)

(b) Factorise $4x + 16x^2$

.....

(2)

(c) Factorise $ab^3 - 2ab^2$

.....

(2)

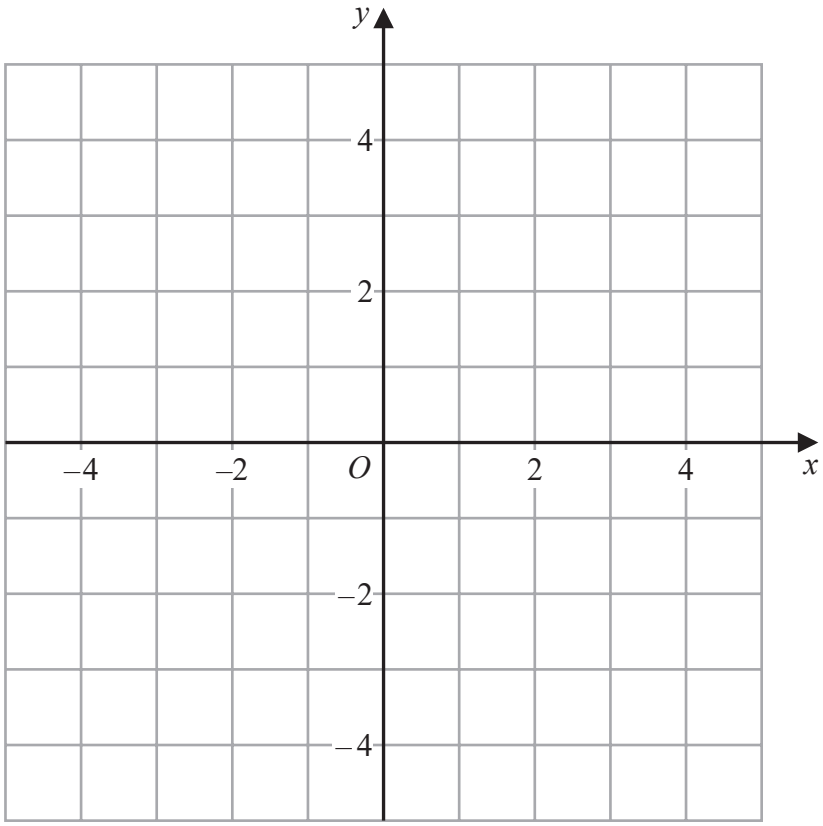
(Total for Question 3 is 5 marks)

4 Place a tick in the table to show which one of the following is a formula.

	Formula
$\frac{ap}{2}$	
$x^2 - 3 = 4$	
$R = \frac{1}{2}t + 6$	

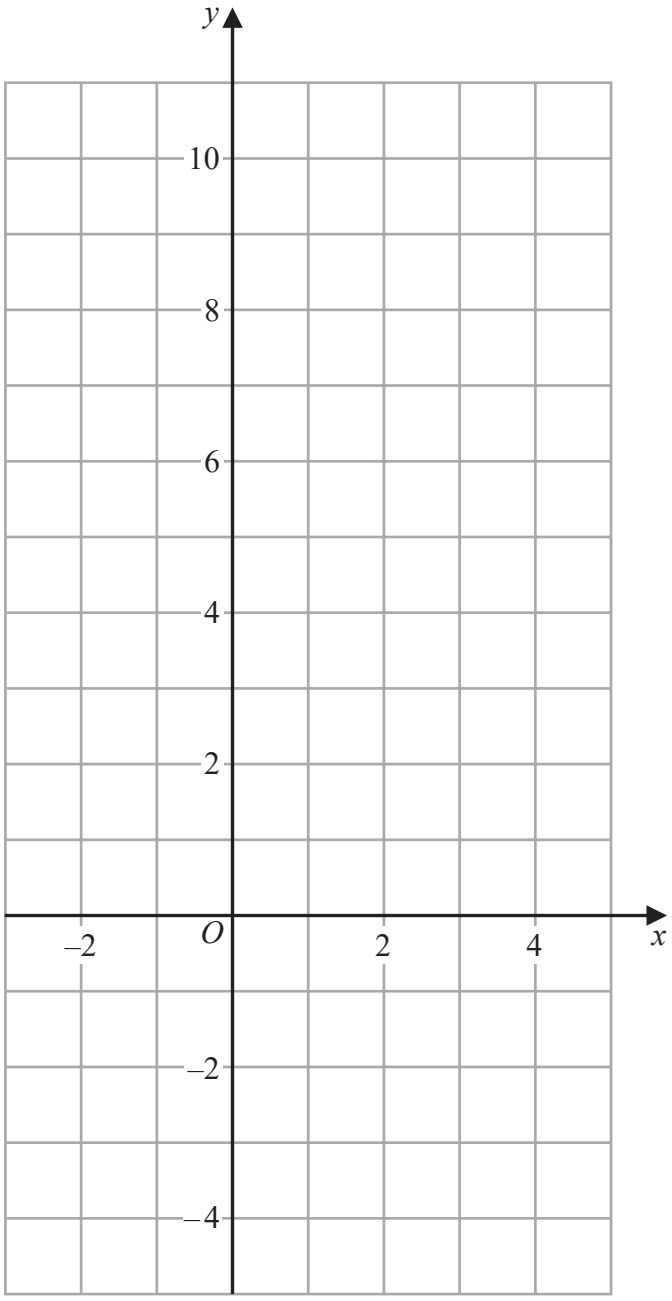
(Total for Question 4 is 1 mark)

5 (a) On the grid below, draw the graph of $y = 4$



(1)

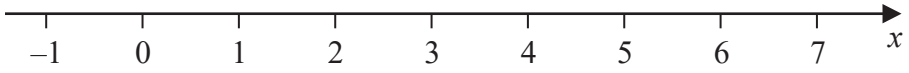
(b) On the grid below, draw the graph of $y = 6 - 2x$ for values of x from –2 to 4



(3)

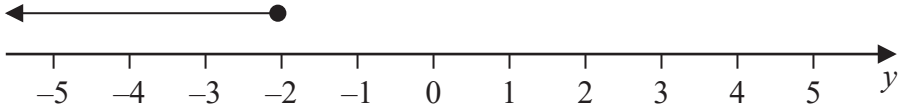
(Total for Question 5 is 4 marks)

6 (a) On the number line below, show the inequality $3 \leqslant x < 5$



(2)

Here is an inequality in y shown on a number line.



(b) Write down the inequality.

.....

(1)

$K > 4$
K is an integer.

(c) Write down the least possible value of K.

.....

(1)

(d) Solve the inequality $4w + 7 \leqslant 3$

.....

(3)

(Total for Question 6 is 7 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

7 (a) Expand $3(w + 2)$

.....

(1)

(b) Expand $3t(t^2 + 3t)$

.....

(2)

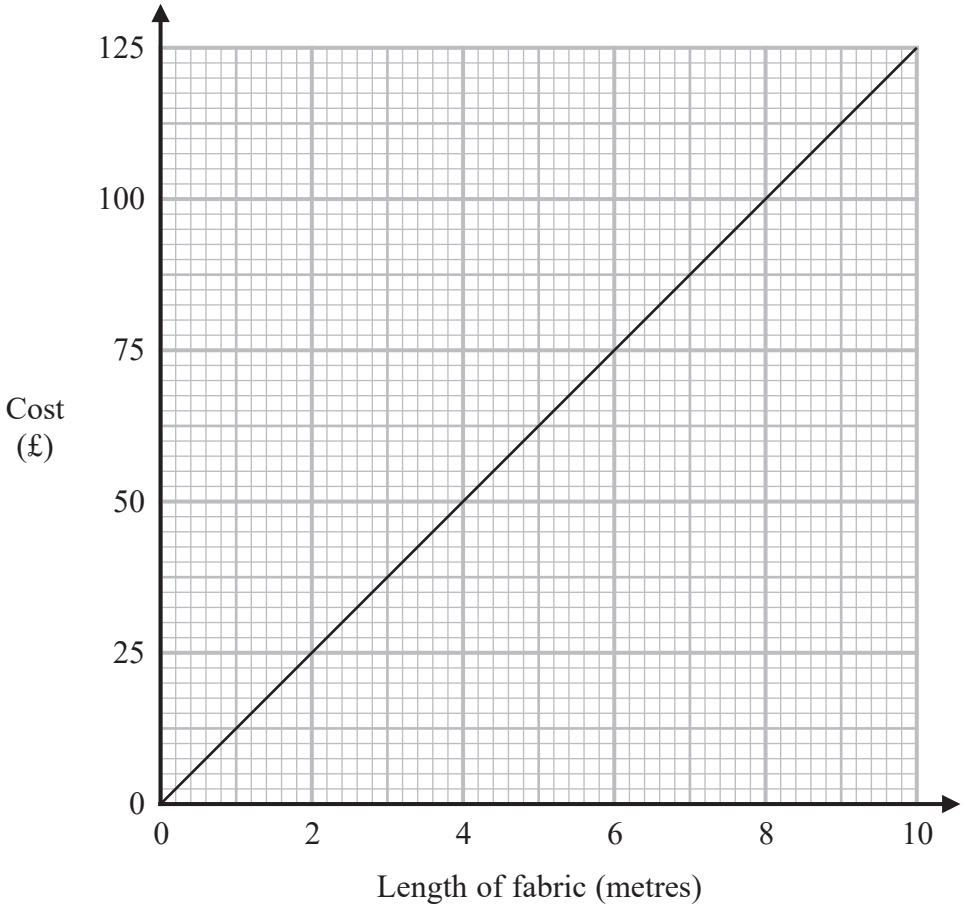
(c) Expand and simplify $4(3x + y) - 2(x - 2y)$

.....

(3)

(Total for Question 7 is 6 marks)

8 This graph can be used to find the cost of buying a length of fabric.



(a) Find the cost of 4 metres of fabric.

£.....

(1)

(b) Work out the gradient of the graph.

.....

(2)

(c) Explain what the gradient of the graph represents.

.....

.....

(1)

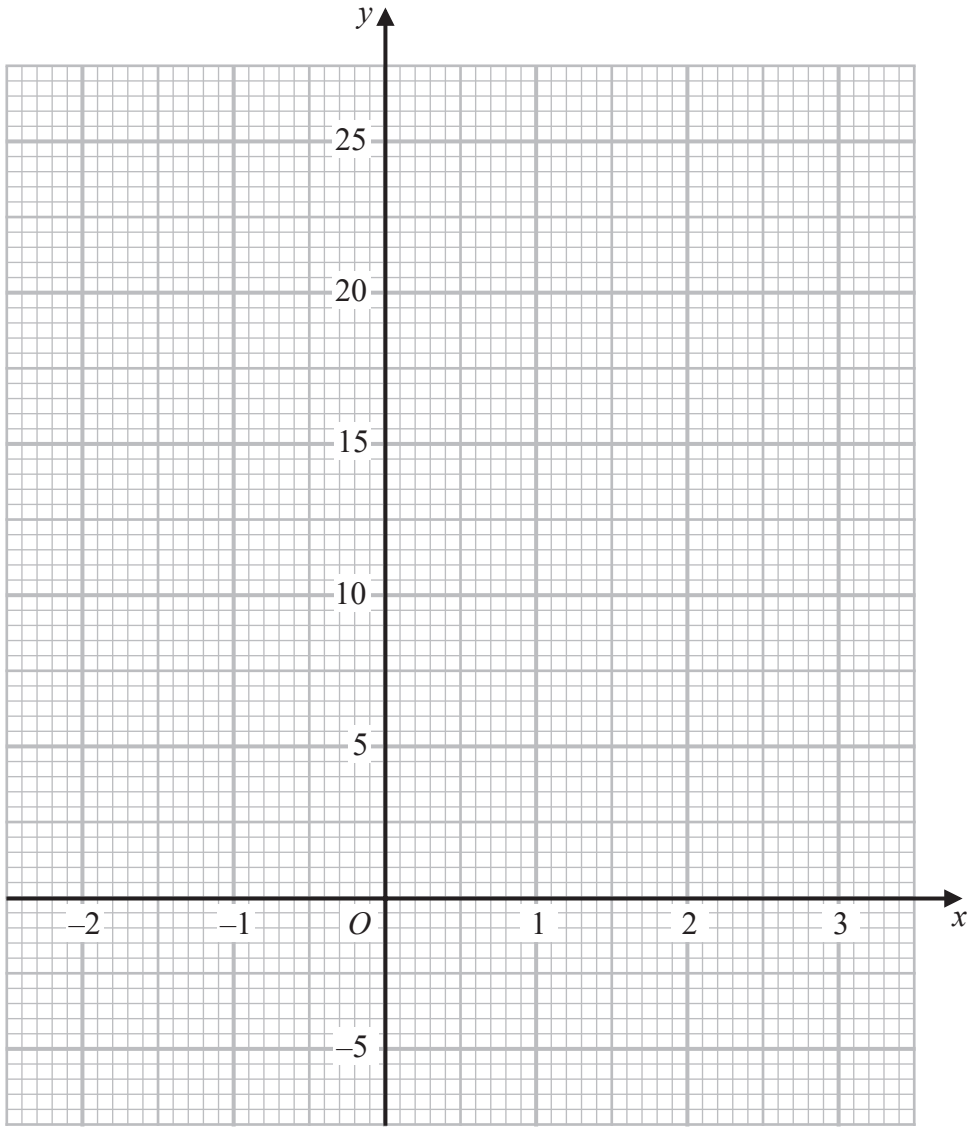
(Total for Question 8 is 4 marks)

9 (a) Complete the table of values for $y = 3x^2 - 2$

x	–2	–1	0	1	2	3
y		1	–2	1		

(2)

(b) On the grid, draw the graph of $y = 3x^2 - 2$ for values of x from –2 to 3



(2)

(c) Use your graph to find estimates for the solutions of $3x^2 - 2 = 5$

.....

(2)

(Total for Question 9 is 6 marks)

10 The 3rd term of a sequence is 12

Other terms of this sequence are found by using the rule

"double the previous term"

(a) Work out the 4th term of this sequence.

.....

(1)

(b) Work out the first term of this sequence.

.....

(2)

Here are the first five terms of an arithmetic sequence.

$$-4 \quad -1 \quad 2 \quad 5 \quad 8$$

(c) Find an expression, in terms of n, for the nth term of this sequence.

.....

(2)

The nth term of a different sequence is given by the expression $80 - 4n$

(d) Work out the 12th term of this sequence.

.....

(2)

(Total for Question 10 is 7 marks)

11 (a) Solve $x + 7 = 3$

$x =$ .....

(1)

(b) Solve $3y - 7 = y + 11$

$y =$ .....

(2)

(c) Solve $2g = 3(g - 4) - 4$

$g =$ .....

(3)

(d) Solve $\frac{3f + 2}{5} = 7$

$f =$ .....

(3)

(Total for Question 11 is 9 marks)

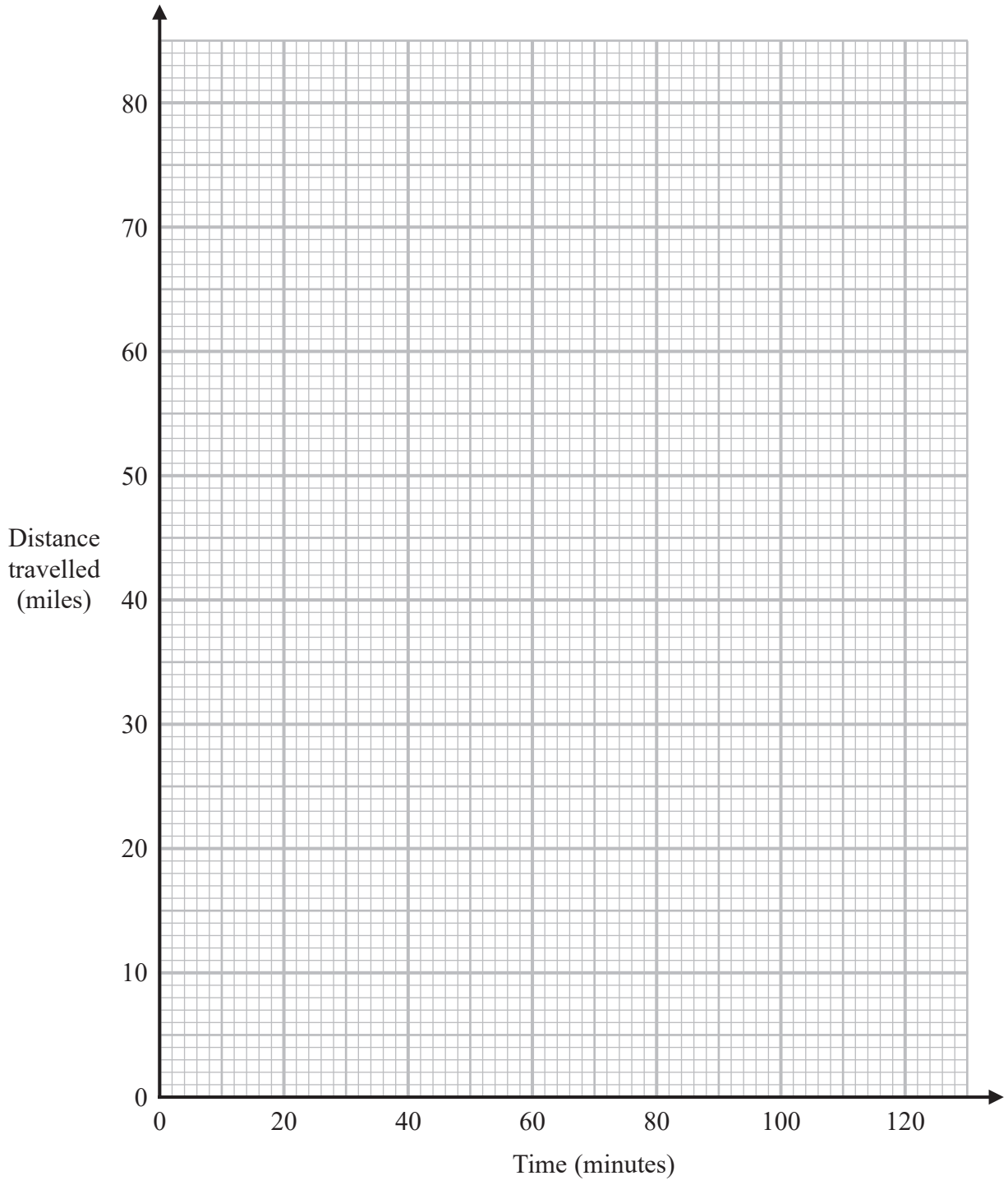
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

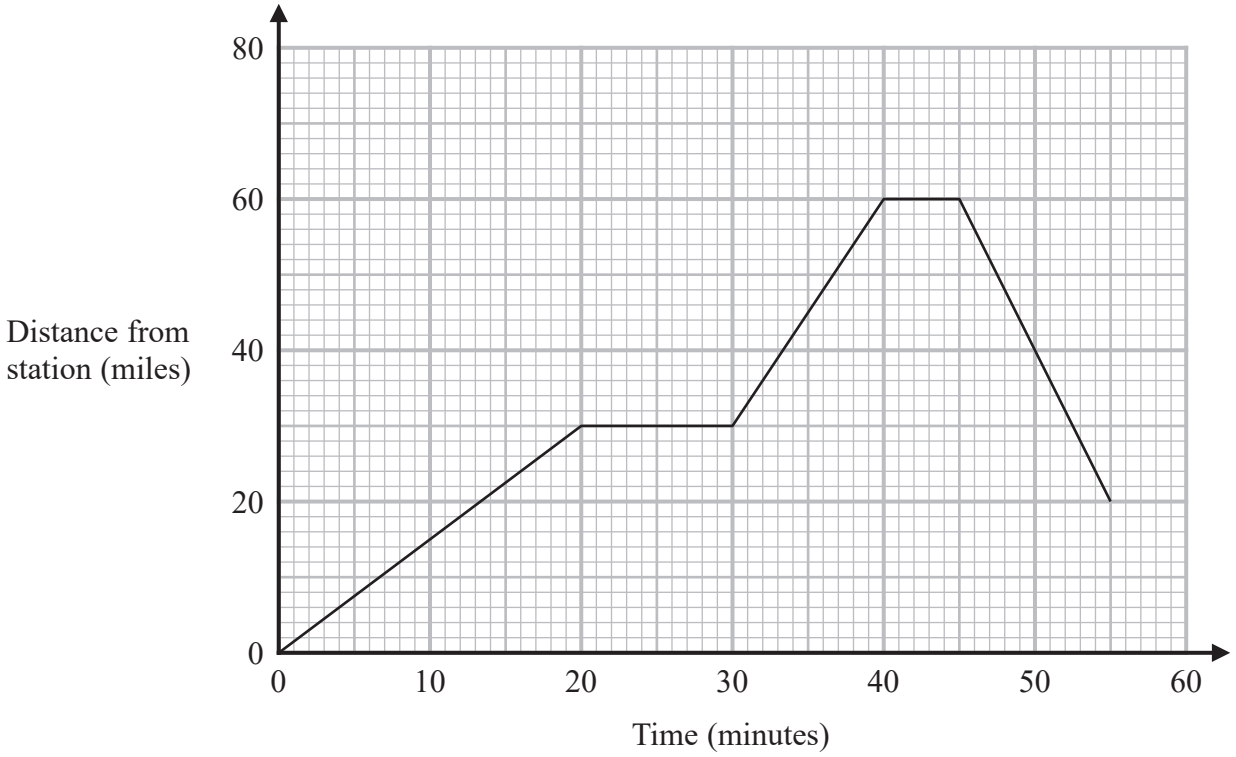
12 A train takes 60 minutes to travel 40 miles at a steady speed.
The train then stops for 5 minutes.
The train then takes 45 minutes to travel 38 miles at a steady speed.

(a) On the grid below, draw the distance-time graph for this information.



(3)

Here is the distance-time graph for the journey of a different train.



(b) Work out the speed of the train for the first 20 minutes of its journey.
Give your answer in miles per hour.

..... miles per hour
(2)

(c) For how many minutes, in total, is the train stationary?

..... minutes
(1)

(d) How far, in total, does the train travel?

..... miles
(2)

(Total for Question 12 is 8 marks)

13 $V = \dfrac{abh}{3}$

(a) Work out the value of V when $a = 4$, $b = 6$ and $h = 5$

$V =$ .....

(2)

(b) Work out the value of a when $V = 15$, $b = 5$ and $h = 2$

$a =$ .....

(2)

(c) Make t the subject of the formula $w = 5(2t + 1)$

.....

(3)

(Total for Question 13 is 7 marks)

14 $y = (x - 3)^2$

(a) (i) Work out the value of y when $x = 0$

.....

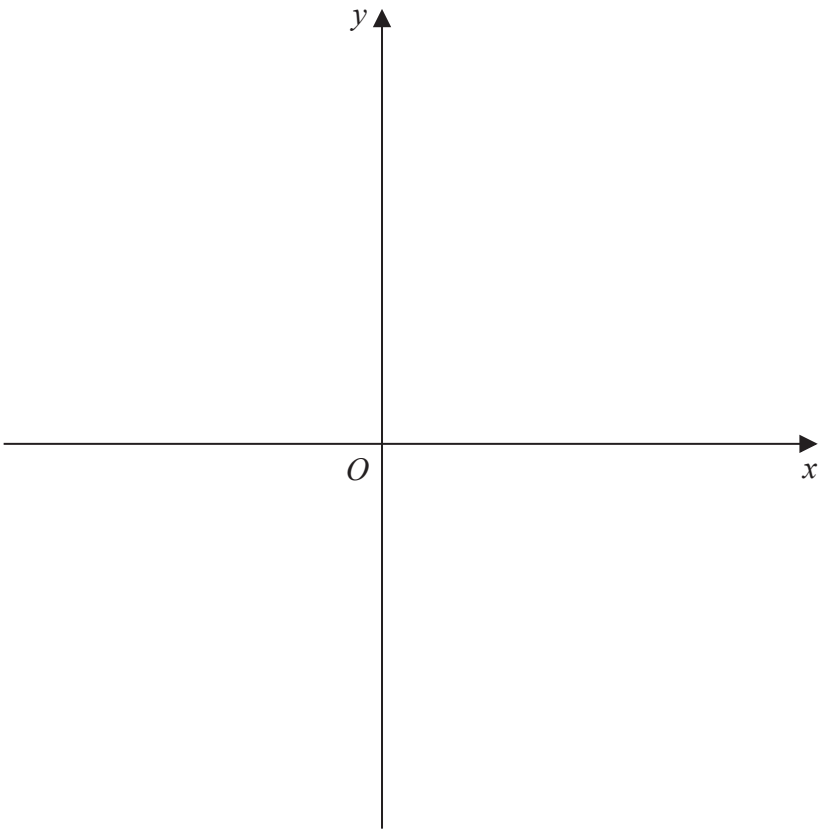
(1)

(ii) Work out the value of x when $y = 0$

.....

(1)

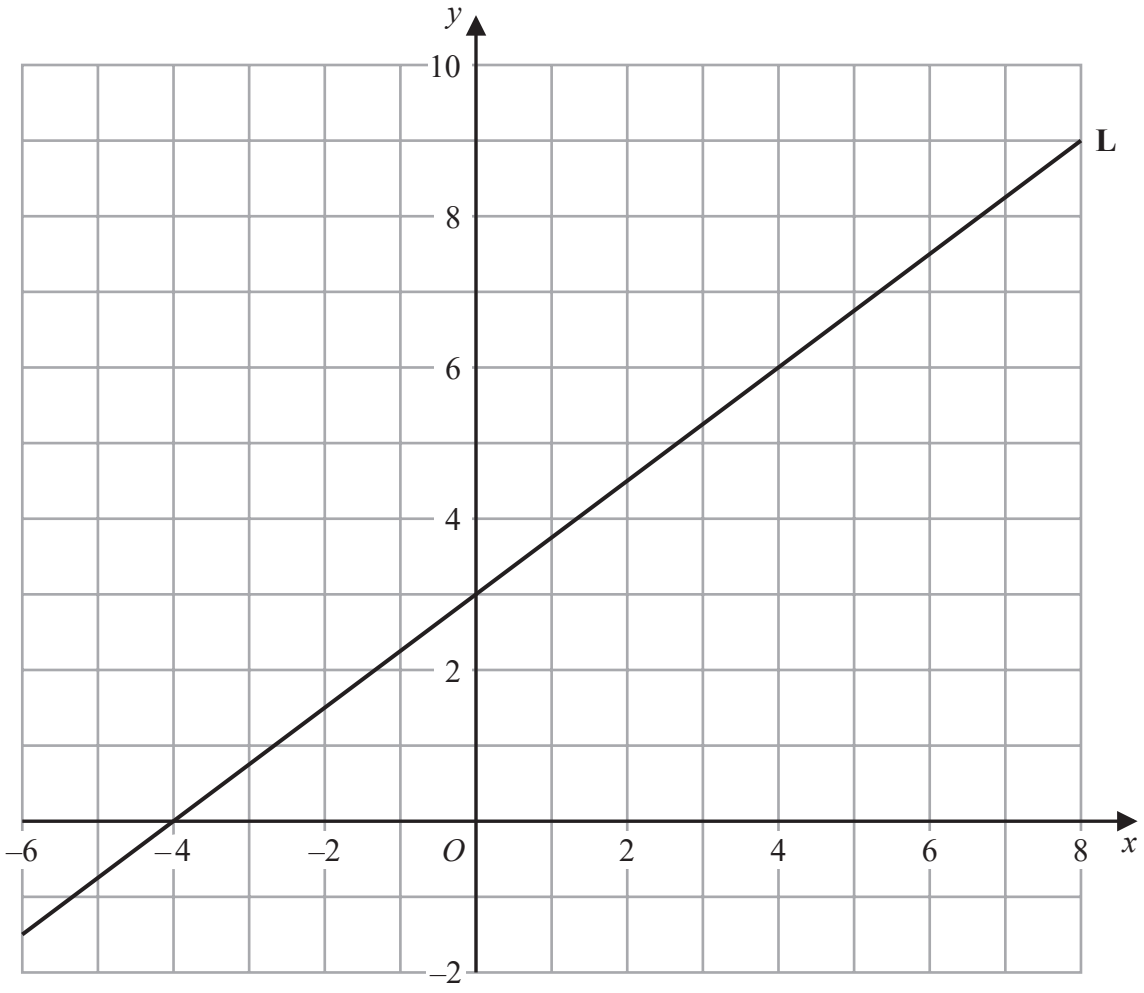
(b) Using the axes below, sketch the graph of $y = (x - 3)^2$
Show the coordinates of the points where the graph meets the axes.



(3)

(Total for Question 14 is 5 marks)

15 Here is a straight line **L** drawn on a grid.



Find an equation for **L**

.....

(Total for Question 15 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

BLANK PAGE

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

BLANK PAGE