OCR
Oxford Cambridge and RSA

MR BRADDER MATHS H

Mr Bradder Maths

Predicted Paper 6

June 2025

MR BRADDER MATHS

You may use:
- geometrical instruments
- tracing paper

Do not use:

Please write clearly in black ink. **Do not write in the barcodes.**

Centre number | | | | | | Candidate number | | | | |

First name(s) _____

Last name _____

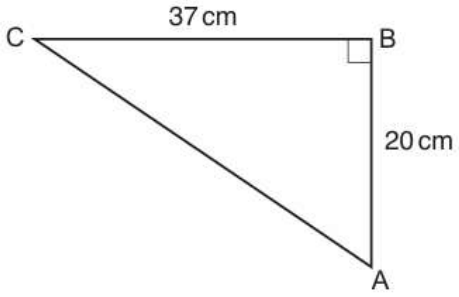
INSTRUCTIONS

- Use black ink. You may use an HB pencil for graphs and diagrams.
- Answer **all** the questions.
- Read each question carefully before you start to write your answer.
- Where appropriate, your answers should be supported with working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided.
- Additional paper may be used if required but you must clearly show your candidate number, centre number and question number(s).

INFORMATION

- The total mark for this paper is **110**
- The marks for each question are shown in brackets **[ ]**.
- This document consists of **16** pages.

1 ABC is a right-angled triangle.
AB = 20 cm and BC = 37 cm.



Not to scale

Calculate angle BAC

. ..... ° **[3]**

2 A cuboid measures 6 cm by 8 cm by 15 cm.

A cube has the same volume as the cuboid. Find the surface area of the cube, giving your answer correct to 3 significant figures.

. ..... cm^2 **[4]**

3 (a) Standard bricks have dimensions 21.5 cm by 10.3 cm by 6.5 cm, correct to 1 decimal place.

A house is built using 4663 standard bricks. Joslin says

Placed end to end, the bricks from the house would definitely reach over 1 km.

Show that Joslin's statement is correct.

[4]

(b) A standard brick should weigh 2.8 kg, correct to 1 decimal place. A truck can carry a maximum load of 20 tonnes.

(i) Calculate the maximum number of standard bricks that the truck should be able to carry.

(b)(i) .....**[3]**

(ii) Explain why your answer to (b)(i) may not be possible to achieve.

.....

.....

[1]

4 **(a)** A transport lorry consists of a cab and a trailer.

The trailer has a volume of 90 m^3.

Alfie makes a model of this lorry using a scale of 1 : 72.

Work out the volume of the trailer in Alfie's model, giving your answer in cm^3.

..... cm^3 **[3]**

(b) Alfie paints his model lorry.

He has eight colours available.

He decides to paint the cab in one colour and the trailer in a different colour.

He then wants to paint his name on the trailer.

The name must be in a different colour to the trailer.

In how many different ways can Alfie paint his model lorry?

(b)..... **[3]**

5 A menu has

- 6 starters
- 10 main dishes
- 7 desserts.

(a) A three-course meal consists of a starter, a main dish and a dessert.

How many different three-course meals are possible?

(a) ..... **[2]**

(b) A two-course meal consists either of a starter with a main dish, a starter with a dessert or a main dish with a dessert.
Show that there are 172 possible different two-course meals.

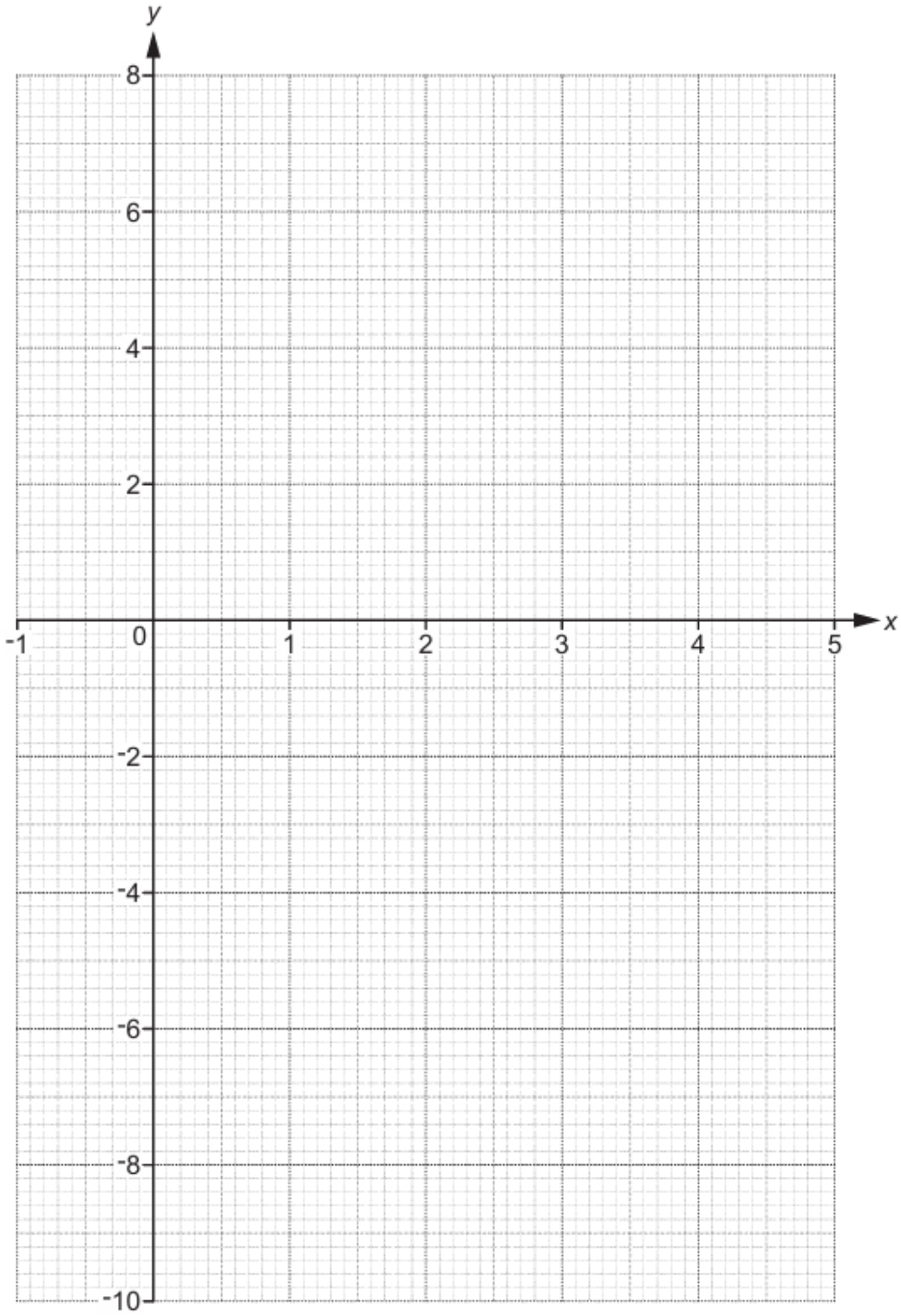
[3]

6 **(a)** Complete the table for $y = x^2 - 4x + 1$ for $-1 \leq x \leq 5$

x	-1	0	1	2	3	4	5
y		1			-2		6

[2]

(b) Draw the graph of $y = x^2 - 4x + 1$ for $-1 \leq x \leq 5$



[3]

7 Marcin buys 7 rulers and 15 crayons for £7.

A ruler costs 12p more than a crayon.

Find the cost of one crayon. cost of one crayon

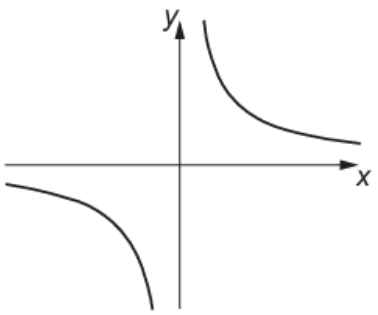
= ..... p **[5]**

8 For each graph below, select its possible equation from this list.

$y = \frac{1}{x}$ $y = \cos x$ $y = x^2$ $y = \left(\frac{1}{2}\right)^x$ $y = 2^x$

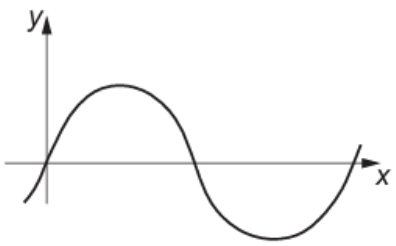
$y = \sin x$ $y = 2^{-x}$ $y = \tan x$ $y = x^3$ $y = \frac{1}{x^2}$

(a)



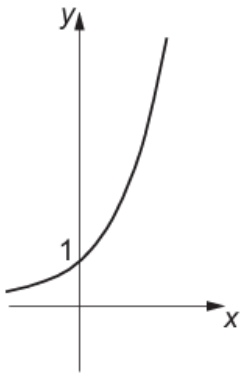
(a) $y =$ .....

(b)



(b) $y =$ .....

(c)



(c) $y =$ .....

[3]

9 A shop records the time taken by its customers to complete a purchase on its website. The results from one day are summarised in this table.

Time taken (t minutes)	Number of customers		
$0 < t \leqslant 3$	6		
$3 < t \leqslant 6$	10		
$6 < t \leqslant 9$	6		
$9 < t \leqslant 12$	2		
$12 < t \leqslant 15$	1		

(a) Calculate an estimate of the mean time taken.

(a) ..... minutes **[4]**

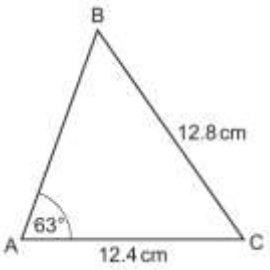
(c) Explain why it is not possible to use the information from this table to calculate the exact value of the mean time taken.

.....

.....

[1]

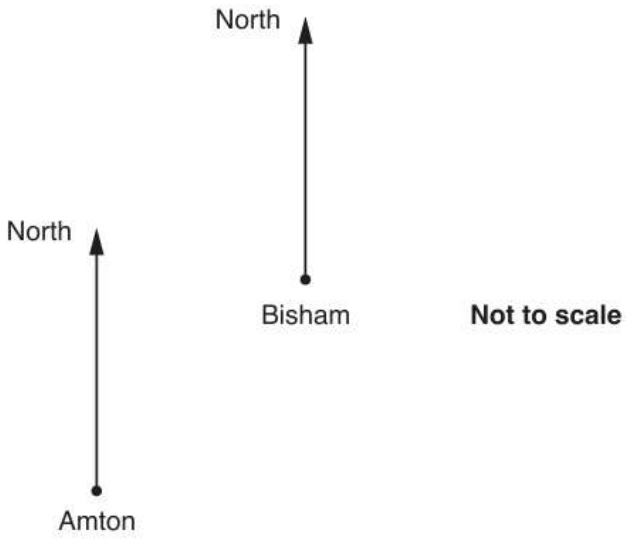
10 Calculate angle ACB in this triangle.



Not to scale

.....° **[4]**

11 The diagram shows the positions of two towns, Amton and Bisham.



Not to scale

The bearing of Bisham from Amton is b°.

The bearing of Amton from Bisham is 6b°.

Calculate the 3-figure bearing of Amton from Bisham

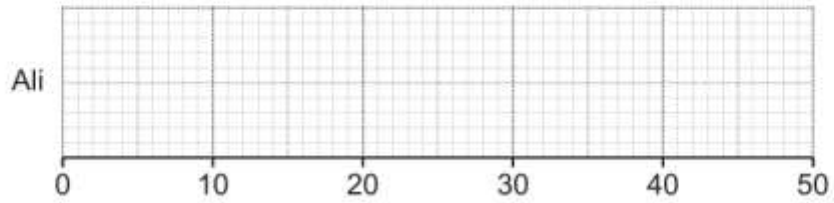
..... ° **[4]**

12 Ali and Beth take it in turns to play a computer game.
On each turn, the player achieves a score out of 50.
Ali and Beth play the computer game many times and record their scores.

(a) Ali's scores are summarised below.

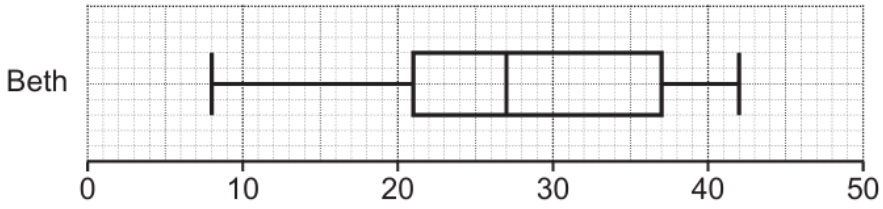
- median = 31
- highest score = 38
- range = 23
- lower quartile = 24
- interquartile range = 11

Draw a box plot to show the distribution of Ali's scores.



[3]

(b) This box plot shows the distribution of Beth's scores.



Find the interquartile range of Beth's scores.

(b) ..... **[2]**

(c) Kareem says

Beth was more consistent than Ali because Beth had a lower median score.

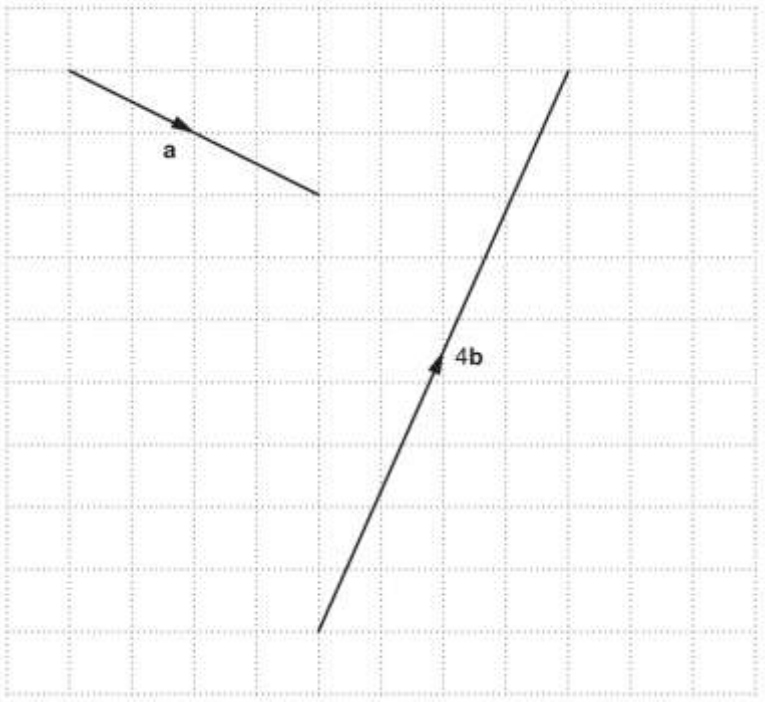
Is his statement correct?
Explain your reasoning.

.....

.....

..... **[2]**

13 Vectors **a** and 4**b** are drawn on the grid.



(a) Write vector **a** as a column vector.

(a) $\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ **[2]**

(b) Find vector **b** as a column vector.

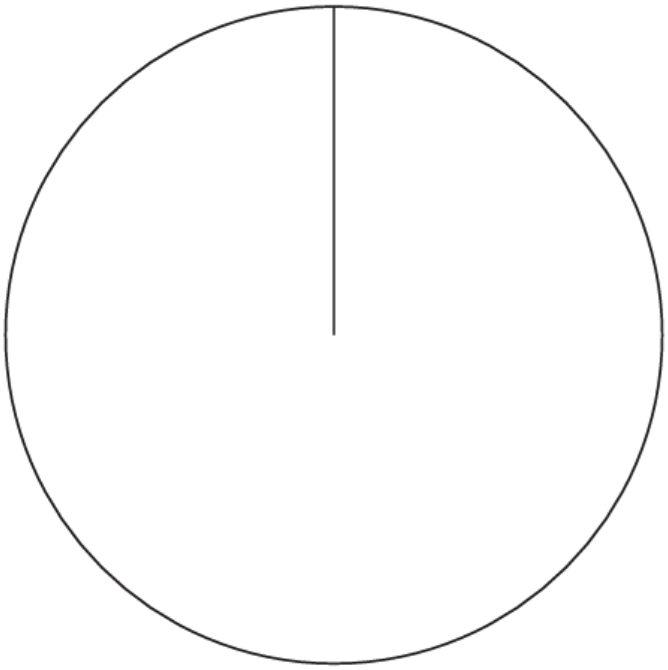
(b) $\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ **[2]**

14 **(a)** The table shows the results for a sports club's 'A' team.

Complete a labelled pie chart to show these results

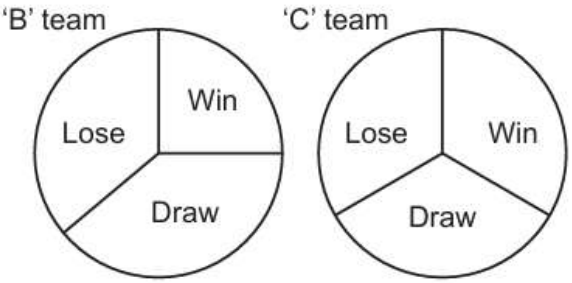
Result	Frequency
Win	18
Draw	10
Lose	12
Total	40

Complete a labelled pie chart to show these results.



[4]

(b) Here are the results for the sports club's 'B' team and 'C' team.



The 'C' team manager says

The pie charts show that the 'C' team won more games than the 'B' team.

Referring to the pie charts, explain why the 'C' team manager may not be correct.

.....

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

15 **(a)** Show that the equation $x^3 - 5x - 1 = 0$ has a solution between $x = 2$ and $x = 3$. **[3]**

16 Use the formula $x_{n+1} = \frac{(x_n)^3}{30} + 2$ with $x_1 = 2$ to calculate x_2 and x_3.
Round your answers correct to 4 decimal places.

x_2 = ... and x_3 = ... **[3]**

17 Ling throws a six-sided dice 300 times.
The table shows the frequencies of their results.

(a) Complete the table to show the relative frequencies.

Number on dice	1	2	3	4	5	6
Frequency	42	27	57	60	39	75
Relative frequency			0.19			

[2]

(b) Ling thinks that the dice may be biased.

(i) Explain why evidence from the table could support their opinion.

.....

.....

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

(ii) Explain why the dice may, in fact, **not** be biased.

.....

.....

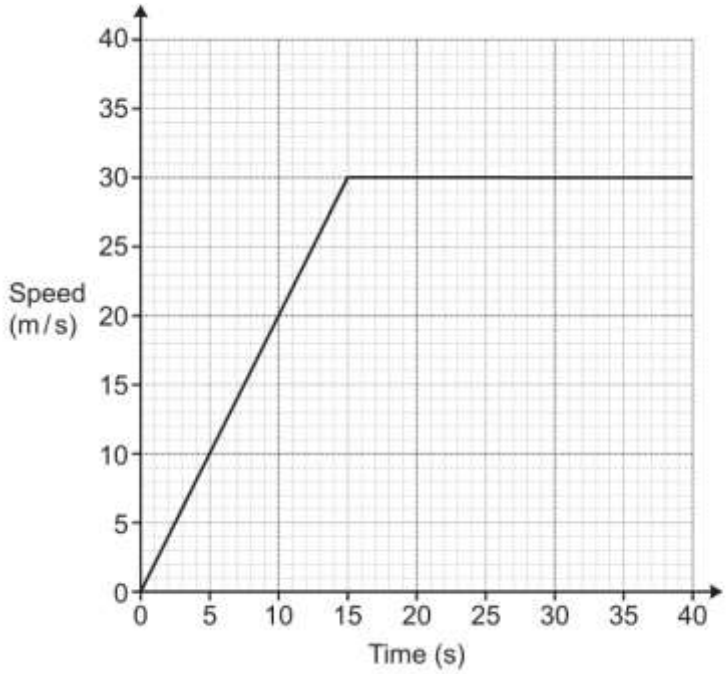
..... **[1]**

18 Solve this equation, giving your answers correct to 1 decimal place.

$$\frac{5}{x+2}+\frac{3}{x-3}=2$$

x = ... or x = ... **[6]**

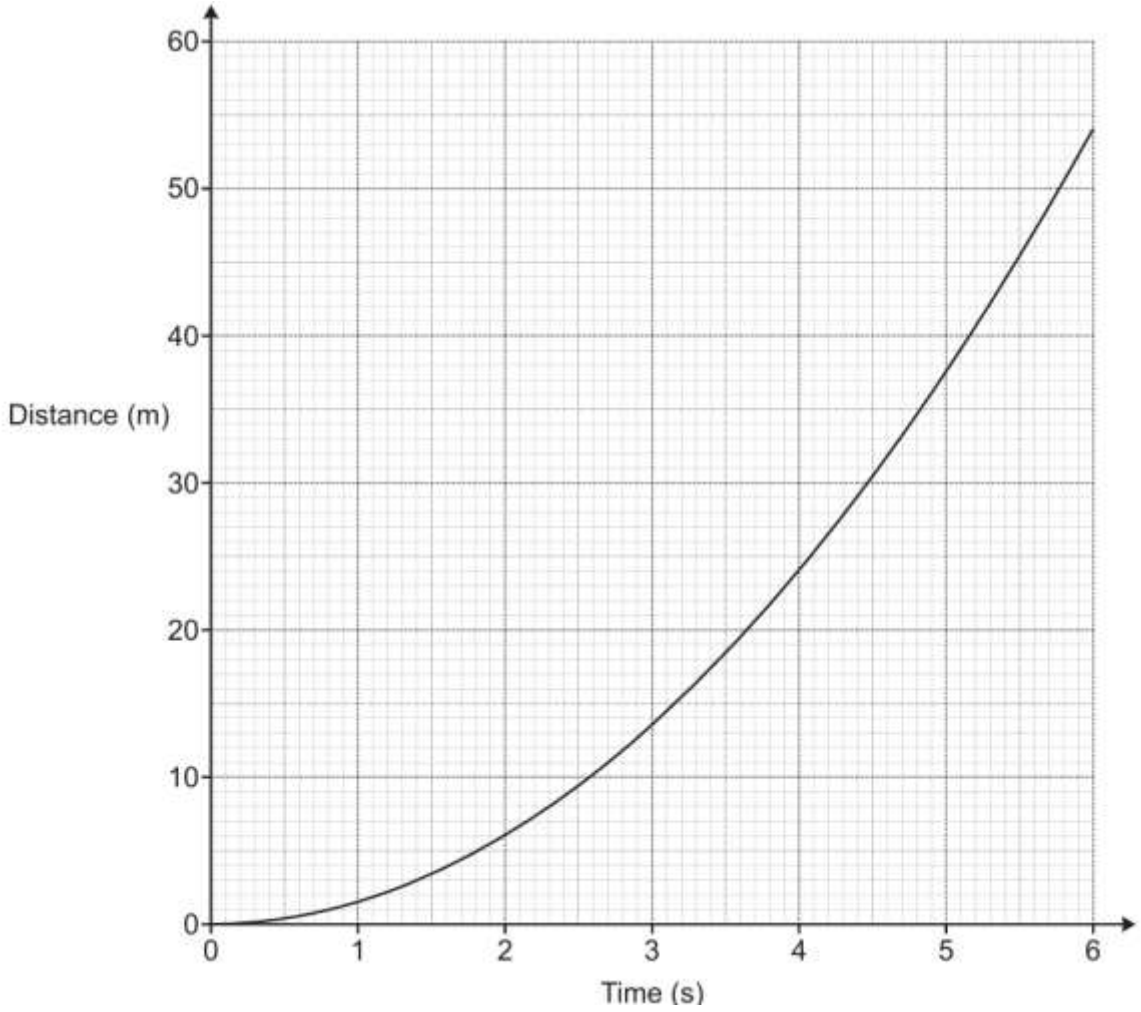
19 **(a)** The graph shows the speed of a vehicle during the first 40 seconds of motion.



Calculate the distance travelled by the vehicle during the 40 seconds.

(a) ..... m **[3]**

(b) The graph shows the distance travelled by a particle over 6 seconds.



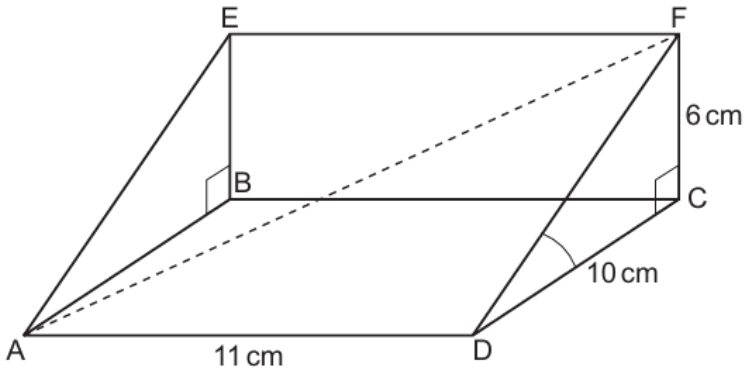
(i) Work out the average speed of the particle between 2 and 4 seconds.

(b)(i) ..... m / s **[2]**

(ii) Estimate the speed of the particle at 4 seconds.

(ii) ..... m / s **[4]**

20 The diagram shows a right-angled triangular prism ABCDEF



Length AD = 11 cm, length CD = 10 cm and length CF = 6 cm.

(a) Calculate the volume of the prism.

(a) ..... cm^3 **[2]**

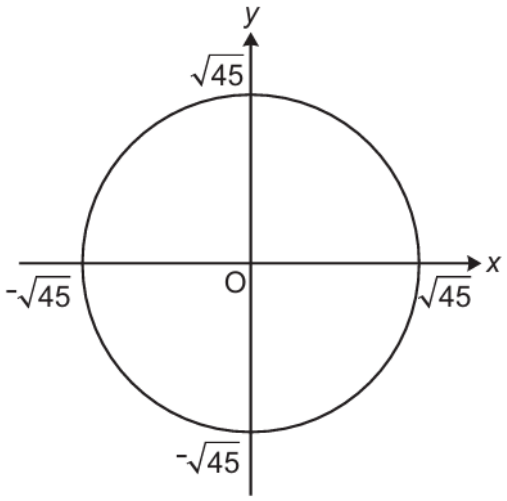
(b) Use trigonometry to show that angle FDC = 31°, correct to the nearest degree.

[2]

(c) Calculate the exact length of AF. (c) ..... cm

[4]

21 Here is a sketch of the circle .



(a) Show that the tangent to this circle at the point (-3, 6) has a gradient of $\frac{1}{2}$. **[2]**

(b) Find the equation of the tangent at the point (-3, 6).

(b) ..... **[2]**

22 Solve this inequality.

$$x^2 + 4x - 12 \leqslant 0$$

Give your answer using set notation.

You must show your working.

..... **[5]**