OCR
Oxford Cambridge and RSA

Wednesday 11 June 2025 – Morning

GCSE (9–1) Mathematics

J560/06 Paper 6 (Higher Tier)

Time allowed: 1 hour 30 minutes

You must have:
- the Formulae Sheet for Higher Tier (inside this document)

You can use:
- a scientific or graphical calculator
- geometrical instruments
- tracing paper

H

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 can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. If you need extra space use the lined page at the end of this booklet. The question numbers must be clearly shown.
- Answer **all** the questions.
- Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.
- Use the π button on your calculator or take π to be 3.142 unless the question says something different.

INFORMATION
- The total mark for this paper is **100**.
- The marks for each question are shown in brackets **[ ]**.
- This document has **24** pages.

ADVICE
- Read each question carefully before you start your answer.

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1 A fair four-sided dice is numbered 3, 4, 5 and 6.
The dice is rolled twice and the two scores are multiplied together.

(a) Complete the table to show all the possible outcomes.

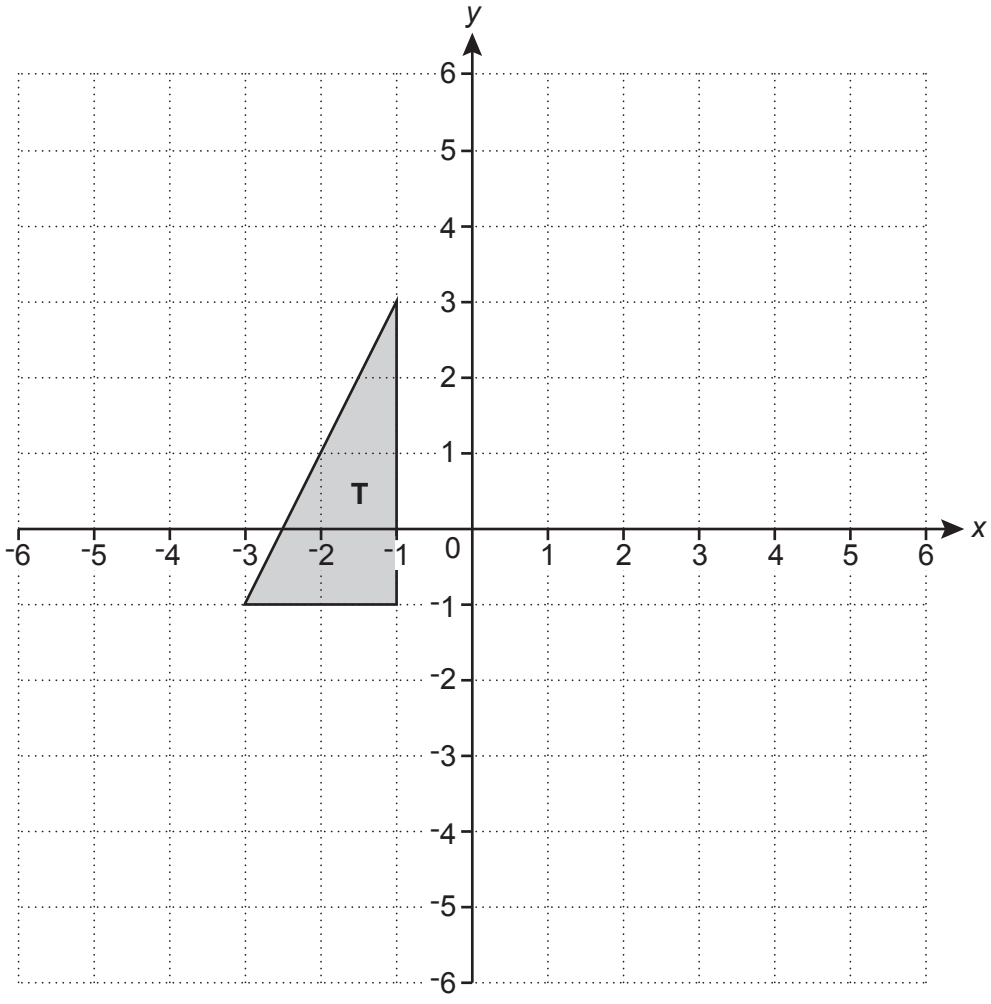
		First roll			
	×	3	4	5	6
Second roll	3		12	15	18
	4	12	16	20	24
	5	15	20		30
	6	18	24	30	

[1]

(b) Find the probability that the outcome is a multiple of 8.

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

2 Triangle **T** is drawn on a coordinate grid.



Translate triangle **T** by vector $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$. **[2]**

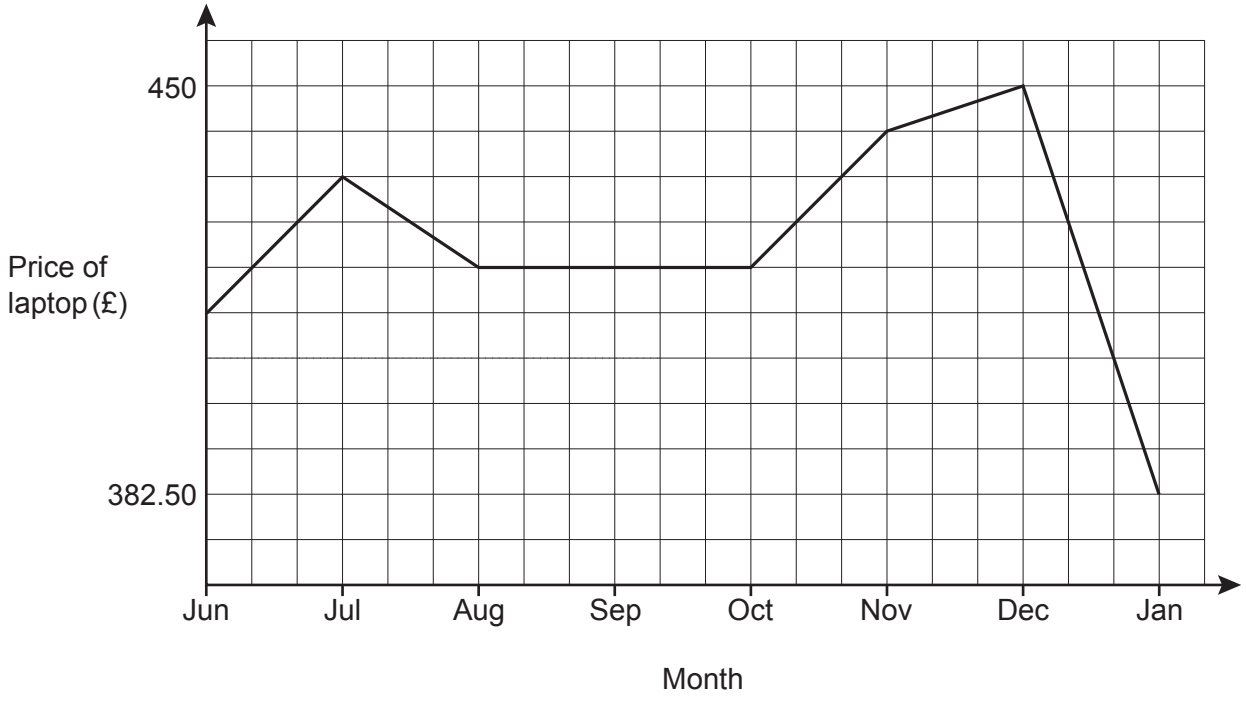
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3 **(a)** The price of a laptop is reduced in a January sale from £450 to £382.50.

Work out the percentage reduction in the price of the laptop.

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

(b) The graph shows the price of the laptop in the months before the January sale.



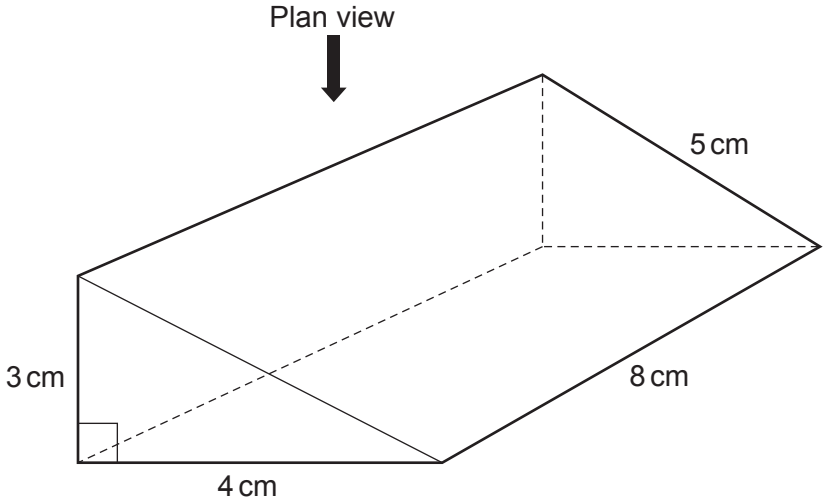
Explain why this graph is misleading.

.....

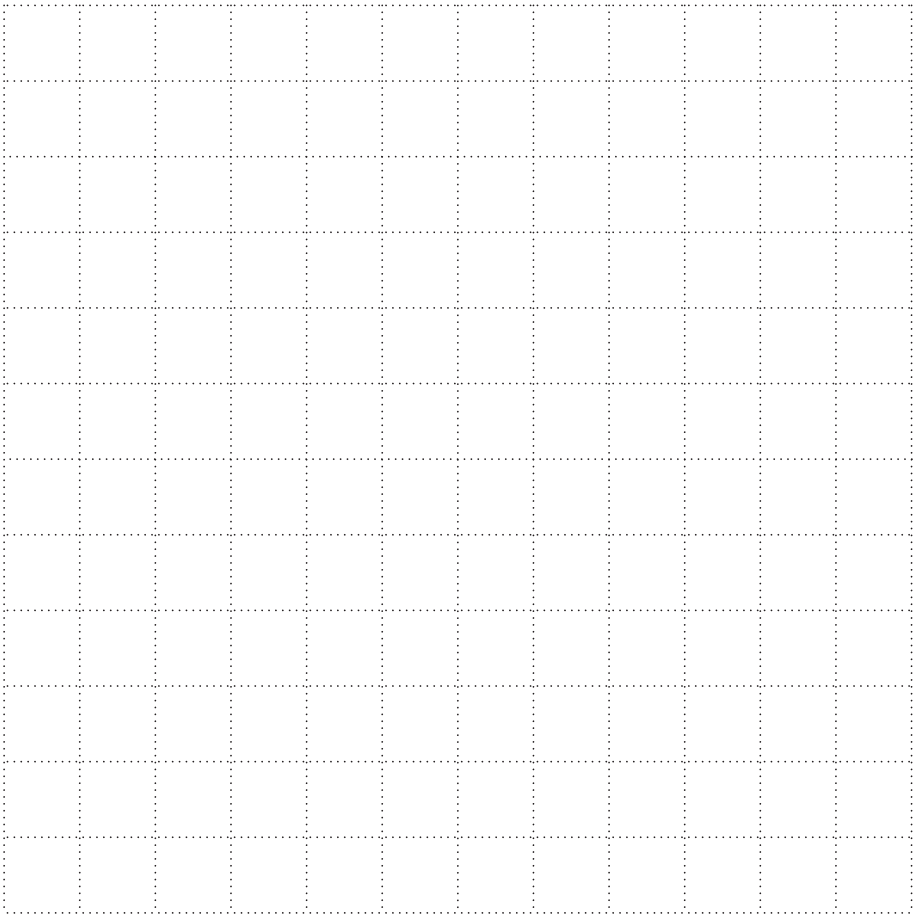
..... **[1]**

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4 The diagram shows a prism of length 8 cm.
The cross-section of the prism is a right-angled triangle.



Draw an accurate plan view of the prism on the one-centimetre grid below.



[2]

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5 A teacher asks their class which of the following values is the smallest.

2^{-1} 4^{-3} 10^{-2}

One student says

2^{-1} is the smallest because 2 is smaller than 4 and 10.

Explain the error made by the student in their **reasoning** and write down the smallest value.

The error is: .....

.....

..... The smallest value is ..... **[2]**

6 A kitchen has space for a fridge.

(a) The width, w, of the space is 70 cm, correct to the nearest centimetre.

Complete the error interval for the width, w.

(a) ..... $\leqslant w <$ ..... **[2]**

(b) A fridge is advertised as having a width of 69.5 cm, correct to 1 decimal place.

Show that this fridge may **not** fit in the space. **[2]**

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7 Each member of a tennis club is classed as a junior, an adult or a senior.

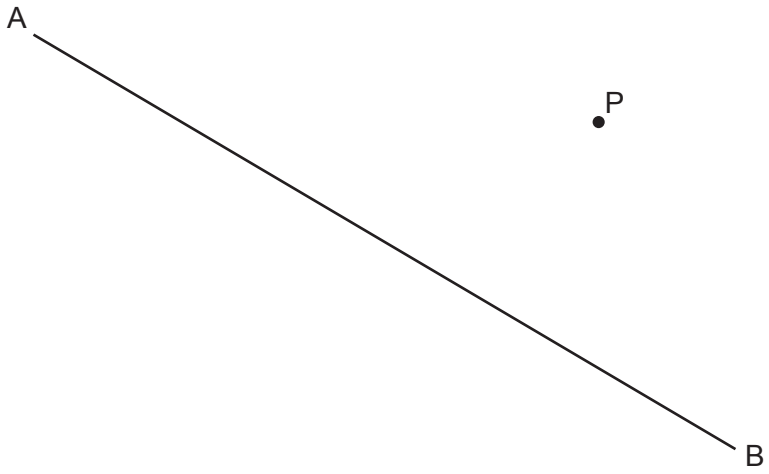
- 16% of the members are seniors.
- The ratio of the number of juniors to the number of adults is 9 : 5.
- There are 95 more juniors than seniors.

Work out the **total** number of members of the tennis club.
You must show your working.

..... **[6]**

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8 Construct the perpendicular from the point P to the line AB.
Show all of your construction lines.



[2]

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9 **(a)** Solve.

$8x - 11 = 6x + 3$

(a) $x =$ ..... **[3]**

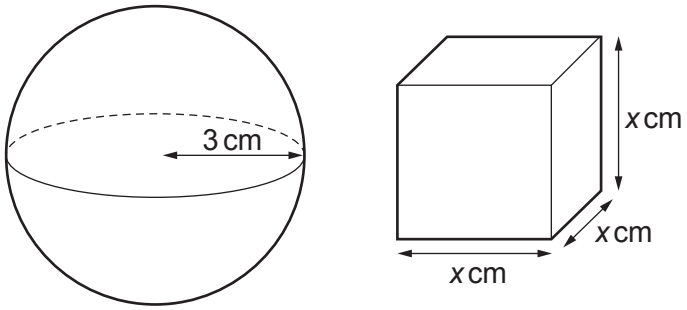
(b) Solve by factorising.

$x^2 + 15x - 16 = 0$

(b) $x =$ ..... or $x =$ ..... **[3]**

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10 The diagram shows a sphere with radius 3 cm and a cube with side length x cm.



The surface area of the sphere is equal to the surface area of the cube.

Work out the side length, x cm, of the cube.
You must show your working.

[The surface area, A, of a sphere with radius r is $A = 4\pi r^2$.]

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

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11 Amit invests some money at a rate of 4% per year compound interest.
After 2 years the value of Amit's investment is £1352.

Work out how much money Amit invested.

£ ..... **[4]**

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12 You may use these kinematics formulae to answer this question.

$v = u + at$

$s = ut + \frac{1}{2}at^2$

where a is the constant acceleration, u is the initial velocity, v is the final velocity, s is the displacement and t is the time taken.

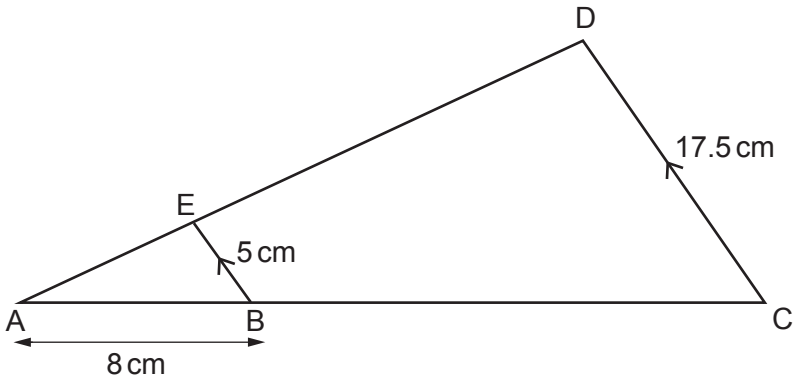
A particle has an initial velocity of 2 m/s.
After 6 seconds the particle has a velocity of 11 m/s.
The particle had constant acceleration.

Work out the distance the particle has travelled in the 6 seconds.

..... m **[4]**

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13 The diagram shows two similar triangles, AEB and ADC.



Not to scale

AB = 8 cm, BE = 5 cm and CD = 17.5 cm

Work out the length of BC.

BC = ... cm **[3]**

14 $16\,807 = 7^5$.

Write 16 807 000 000 as a product of its prime factors.

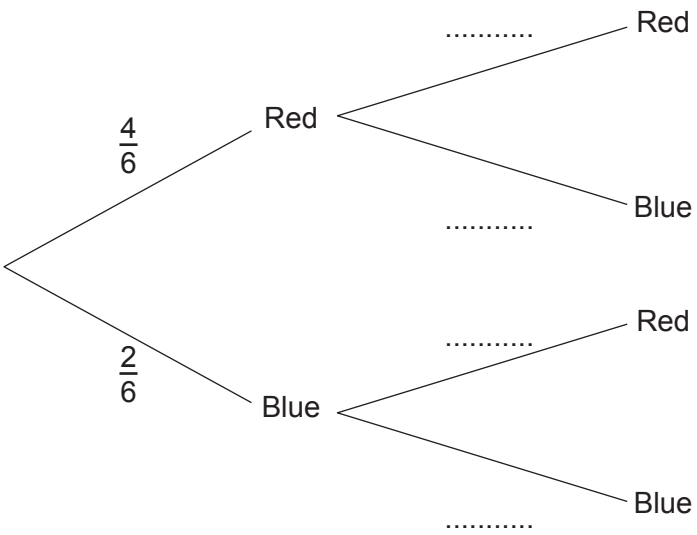
..... **[3]**

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15 A packet of 6 pens contains 4 red pens and 2 blue pens.

A pen is taken at random from the packet and is not replaced.
A second pen is then taken at random from the packet.

(a) Complete the tree diagram.



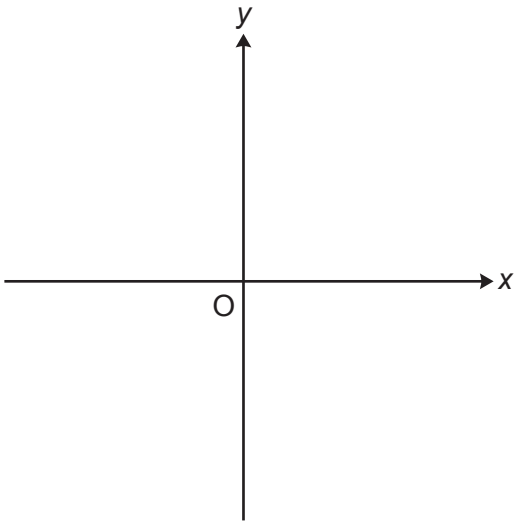
[2]

(b) Find the probability of taking two pens of the same colour.

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

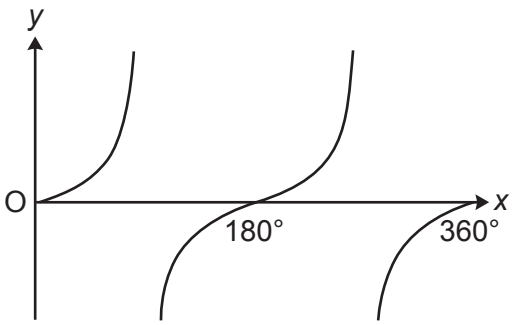
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16 **(a)** On the axes below, sketch the graph $y = -x^2$.



[2]

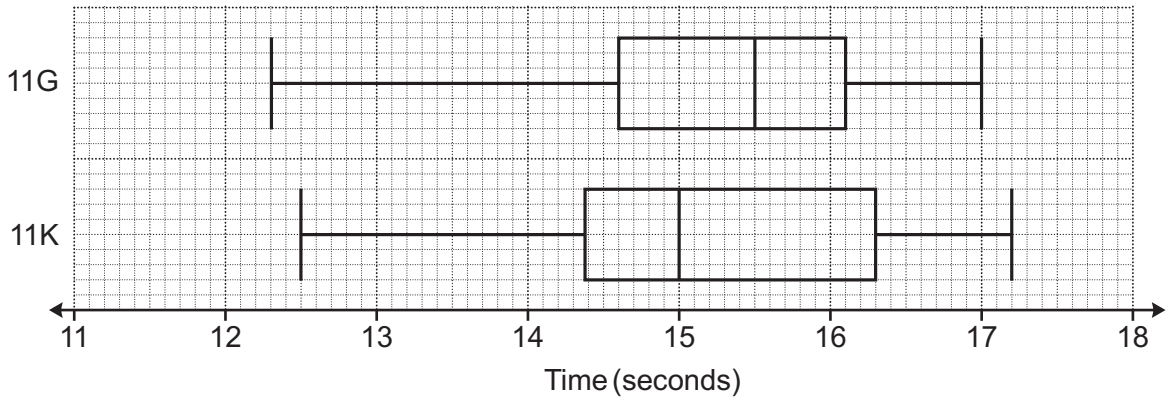
(b) Write down a possible equation for the graph sketched below.



(b) $y =$ ..... **[1]**

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17 Two Year 11 classes, 11G and 11K, record their times for a race.
The box plots show the distribution of the times, in seconds, for each class.



(a) Write down the percentage of students in **11G** who took longer than 14.6 seconds.

(a) ..... % **[1]**

(b) Which class, 11G or 11K, was fastest on average?
Include values to support your decision.

Class ..... because .....

.....

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

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18 Sasha creates a four-digit passcode.

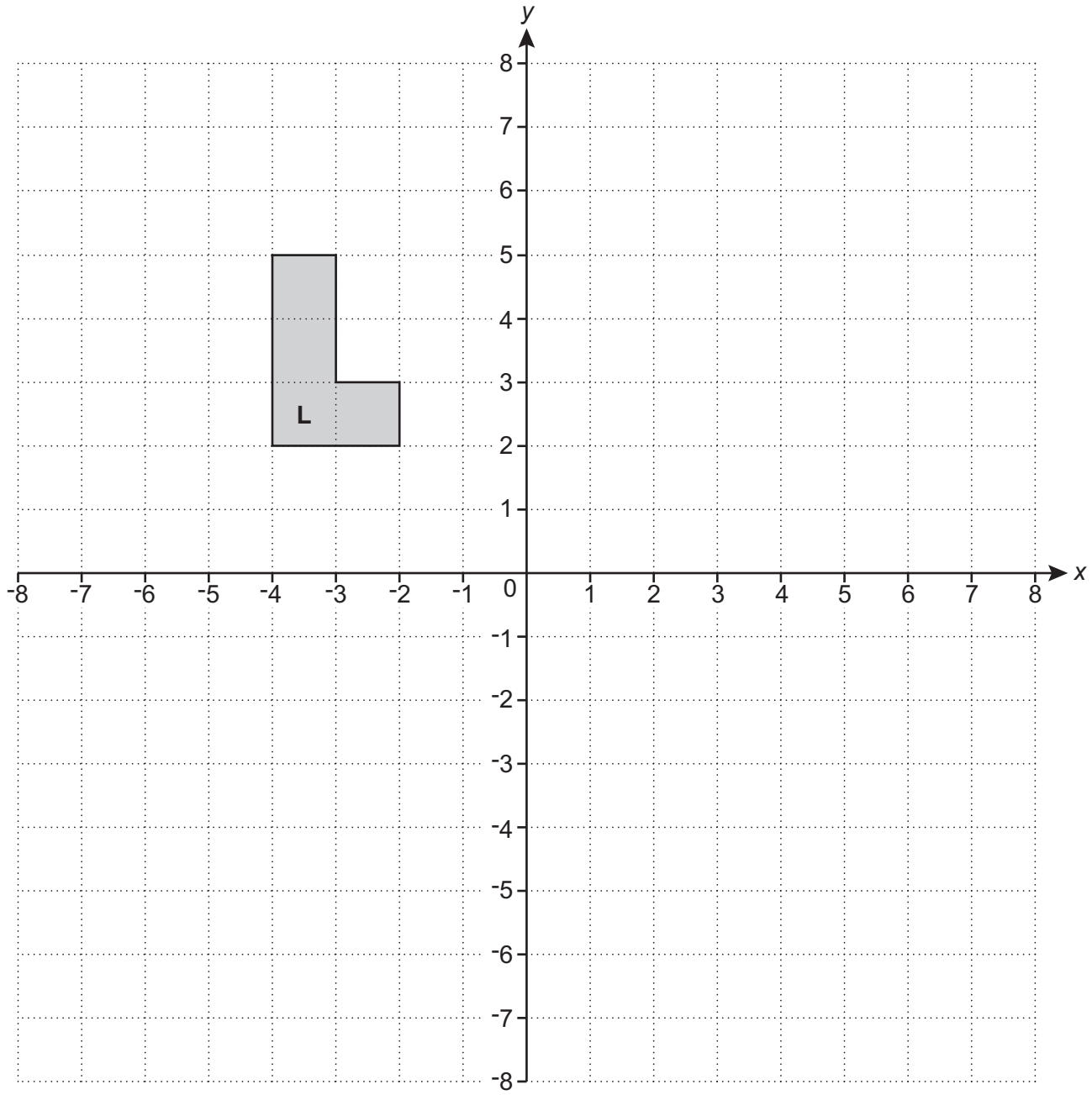
They use four digits from 0 to 9.
They do not use any digit more than once.

Work out how many of the possible four-digit passcodes are even.

..... **[4]**

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19 Shape **L** is drawn on the grid.



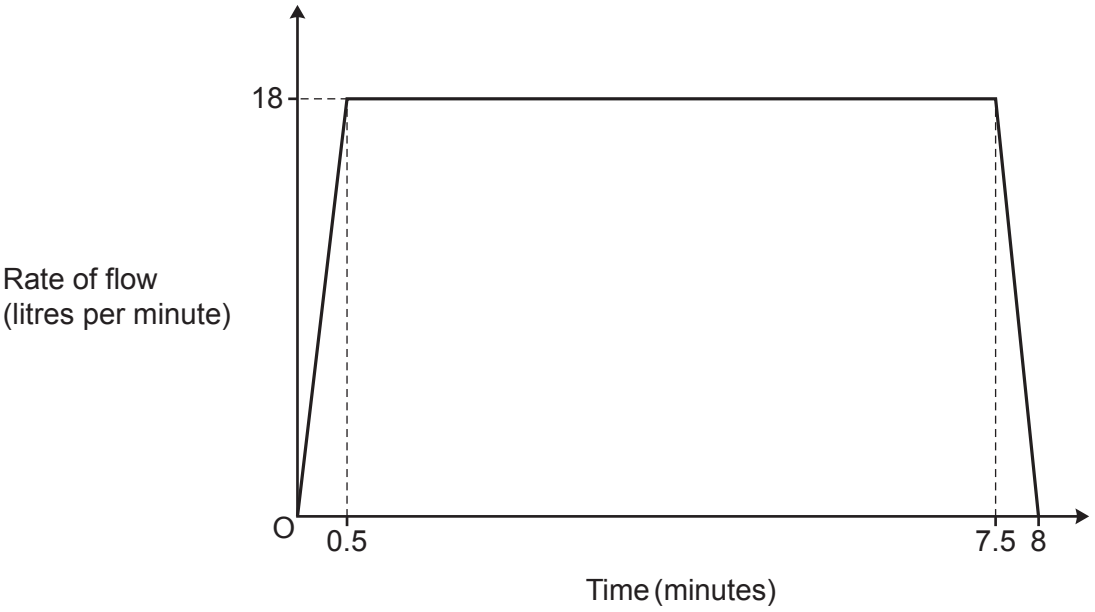
Enlarge shape **L** with scale factor $^{-}2$ and centre of enlargement at ($^{-}1$, 2). **[3]**

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20 A container takes 8 minutes to be filled with water.

The graph shows the rate of flow, in litres per minute, of the water into the container during the 8 minutes.

Not to scale



(a) Show that 126 litres of water flows into the container between 0.5 minutes and 7.5 minutes.

[1]

(b) Work out the average rate of flow, in litres per minute, of water into the container during the 8 minutes.

(b) ..... litres per minute **[4]**

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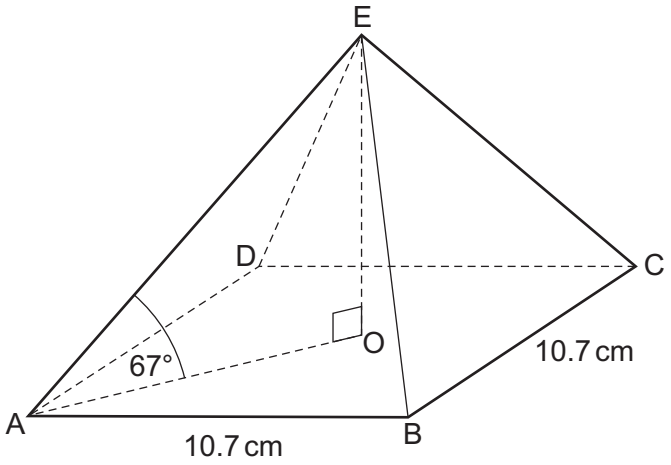
21 The graph of $y = -3x$ intersects the graph of $x^2 + y^2 = 70$ at two points.

Work out the exact coordinates of the two points.
You must show your working.

(..... , ...) and (..... , ...) **[5]**

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22 The diagram shows a square-based pyramid ABCDE.
O is the centre of the base.



The length of the base is 10.7 cm.
Angle EAO is 67°.

Calculate the length of AE.
You must show your working.

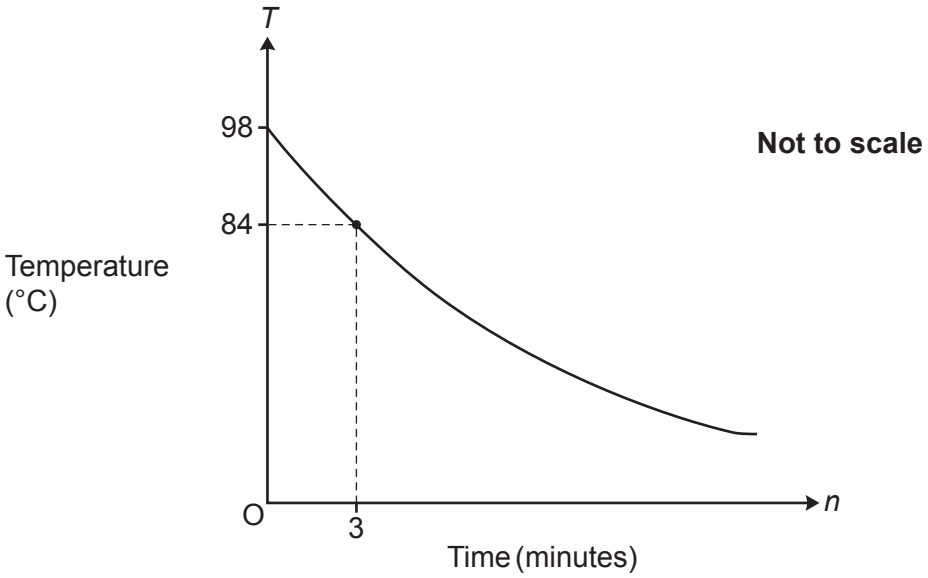
AE = ... cm **[6]**

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23 A pot of tea is made using boiling water and left to cool.
The temperature, T°C, of the pot of tea after n minutes is given by the formula

$T = ab^n$.

The graph shows some information about the temperature of the pot of tea.



Find the value of a and the value of b.

$a =$ .....

$b =$ ..... **[3]**

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24 **(a)** Show that the equation $x^4 + 3x^2 - 2x - 5 = 0$ has a solution between $x = 1$ and $x = 2$. **[3]**

(b) Find this solution correct to **1** decimal place.
You must show calculations to support your answer.

(b) $x =$ ..... **[4]**

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25 A bag contains only round tiles and square tiles.
Each tile is either black or white.

The ratio of round tiles to square tiles is 3 : 1.
45% of all the tiles are round black tiles.
9% of all the tiles are square white tiles.

Show that the proportion of round tiles that are black is less than the proportion of square tiles that are black. **[6]**

END OF QUESTION PAPER

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