Cambridge IGCSE

**Cambridge Assessment International Education**
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER



**CAMBRIDGE INTERNATIONAL MATHEMATICS** **0607/32**

Paper 3 (Core) **May/June 2019**

**1 hour 45 minutes**

Candidates answer on the Question Paper.

Additional Materials: Geometrical Instruments
Graphics Calculator

**READ THESE INSTRUCTIONS FIRST**

Write your centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
Do not use staples, paper clips, glue or correction fluid.
You may use an HB pencil for any diagrams or graphs.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** the questions.
Unless instructed otherwise, give your answers exactly or correct to three significant figures as appropriate.
Answers in degrees should be given to one decimal place.
For $\pi$, use your calculator value.
You must show all the relevant working to gain full marks and you will be given marks for correct methods, including sketches, even if your answer is incorrect.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks for this paper is 96.

This document consists of **16** printed pages.

DC (SC/TP) 168252/2


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[Turn over

## Formula List

| | |
|---|---|
| Area, $A$, of triangle, base $b$, height $h$. | $A = \frac{1}{2}bh$ |
| Area, $A$, of circle, radius $r$. | $A = \pi r^2$ |
| Circumference, $C$, of circle, radius $r$. | $C = 2\pi r$ |
| Curved surface area, $A$, of cylinder of radius $r$, height $h$. | $A = 2\pi rh$ |
| Curved surface area, $A$, of cone of radius $r$, sloping edge $l$. | $A = \pi rl$ |
| Curved surface area, $A$, of sphere of radius $r$. | $A = 4\pi r^2$ |
| Volume, $V$, of prism, cross-sectional area $A$, length $l$. | $V = Al$ |
| Volume, $V$, of pyramid, base area $A$, height $h$. | $V = \frac{1}{3}Ah$ |
| Volume, $V$, of cylinder of radius $r$, height $h$. | $V = \pi r^2 h$ |
| Volume, $V$, of cone of radius $r$, height $h$. | $V = \frac{1}{3}\pi r^2 h$ |
| Volume, $V$, of sphere of radius $r$. | $V = \frac{4}{3}\pi r^3$ |

Answer **all** the questions.

**1** **(a)** Write in words the number 27 003.

..... [1]

**(b)** Write 0.37 as a fraction.

..... [1]

**(c)** Write down a square number between 30 and 50.

..... [1]

**(d)** Complete the list of factors of 12.

..... , 2 , ..... , ..... , 6 , ..... [2]

**(e)** Work out $\sqrt{2.6} - 0.7^2$.

..... [1]

**2** Mr and Mrs Tan and their three children go on a boat trip.

**(a)** One adult fare costs \$15 and one child fare costs \$8.

**(i)** Find the total cost of their fares.

\$ ..... [2]

**(ii)** Find how much change they receive from \$100.

\$ ..... [1]

**(b)** The boat sails 6 km in 90 minutes.

Work out the speed of the boat in km/h.

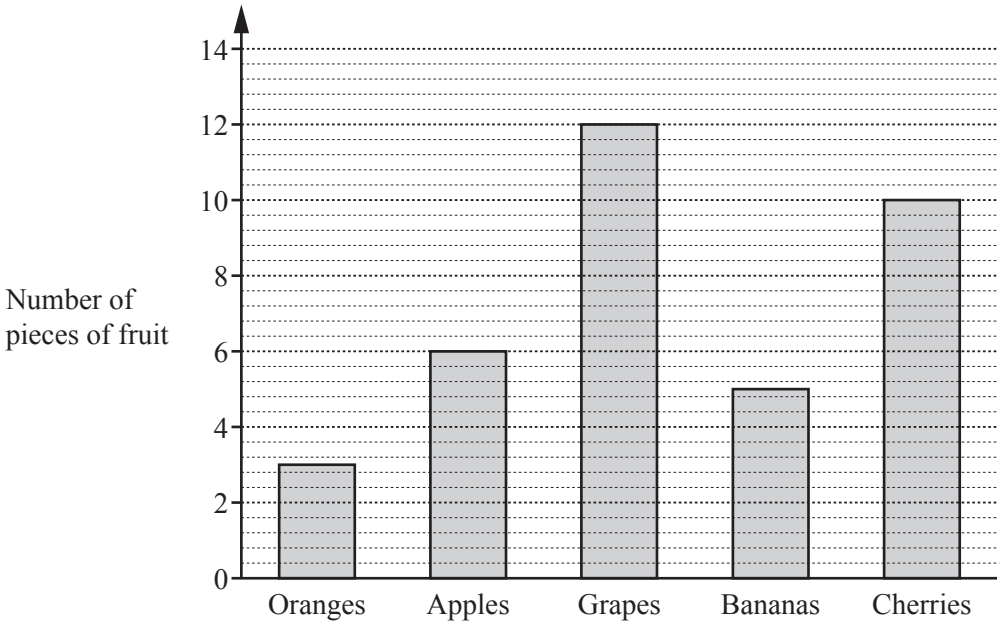
..... km/h [3]





**[Turn over**

**3** **(a)** The bar chart shows the number of pieces of different types of fruit in a basket.




**(i)** Find the total number of pieces of fruit in the basket.

..... [1]

**(ii)** Find how many more cherries there are than oranges.

..... [1]

**(iii)** One piece of fruit is chosen at random from the basket.

Find the probability that it is a banana.

..... [1]

**(iv)** Find the percentage of pieces of fruit in the basket that are apples.

.....% [2]

**(b)** 15 18 21 32 11 8 34 17 21 6 45

From this list of eleven numbers, find

**(i)** the mode,

..... [1]

**(ii)** the range,

..... [1]

**(iii)** the median,

..... [1]

**(iv)** the mean,

..... [1]

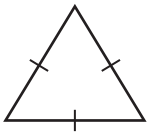
**(v)** the lower quartile,

..... [1]

**(vi)** the inter-quartile range.

..... [1]

**4** **(a)** Write down the correct mathematical name for each shape.



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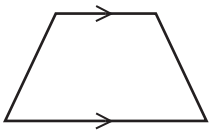

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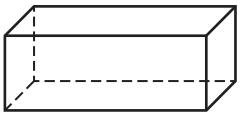

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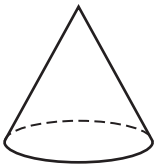
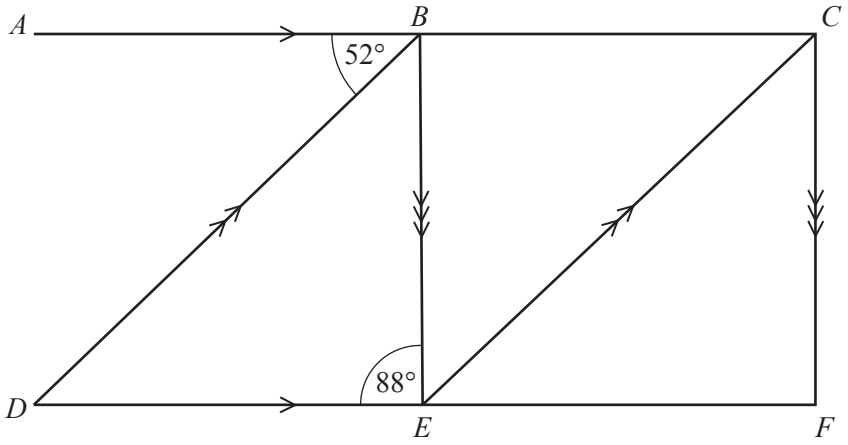


.....

[4]

**(b)**




NOT TO SCALE

*ABC* is parallel to *DEF*, *DB* is parallel to *EC* and *BE* is parallel to *CF*.
Angle *ABD* = 52° and angle *DEB* = 88°.

Find the size of

**(i)** angle *BDE*,

Angle *BDE* = ..... [1]

**(ii)** angle *DBE*,

Angle *DBE* = ..... [1]

**(iii)** angle *CFE*,

Angle *CFE* = ..... [1]

**(iv)** angle *CBE*,

Angle *CBE* = ..... [1]

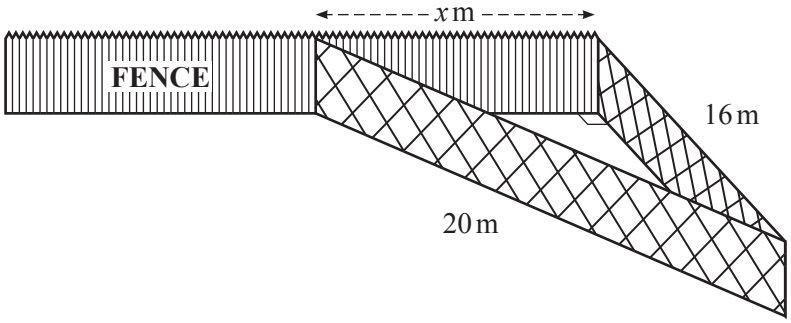
**(v)** angle *BEC*.

Angle *BEC* = ..... [1]



**[Turn over**

**5** **(a)** Siobhan makes a rabbit run in the shape of a right-angled triangle.
She uses $x$ metres of the garden fence for one side of the run.
The other two sides are made from 36 metres of wire mesh, as shown in the diagram.




NOT TO SCALE

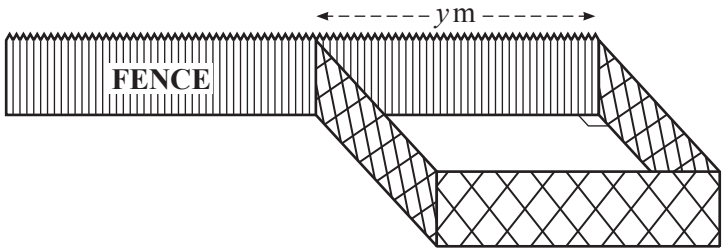
**(i)** Work out the value of $x$.

$x =$ ..... [3]

**(ii)** Find the area of garden used for the run.

.....$m^2$ [1]

**(b)** Siobhan's friend makes a rabbit run in the shape of a square.
She uses $y$ metres of the garden fence for one side of the run.
The other three sides are made from 36 metres of wire mesh.




NOT TO SCALE

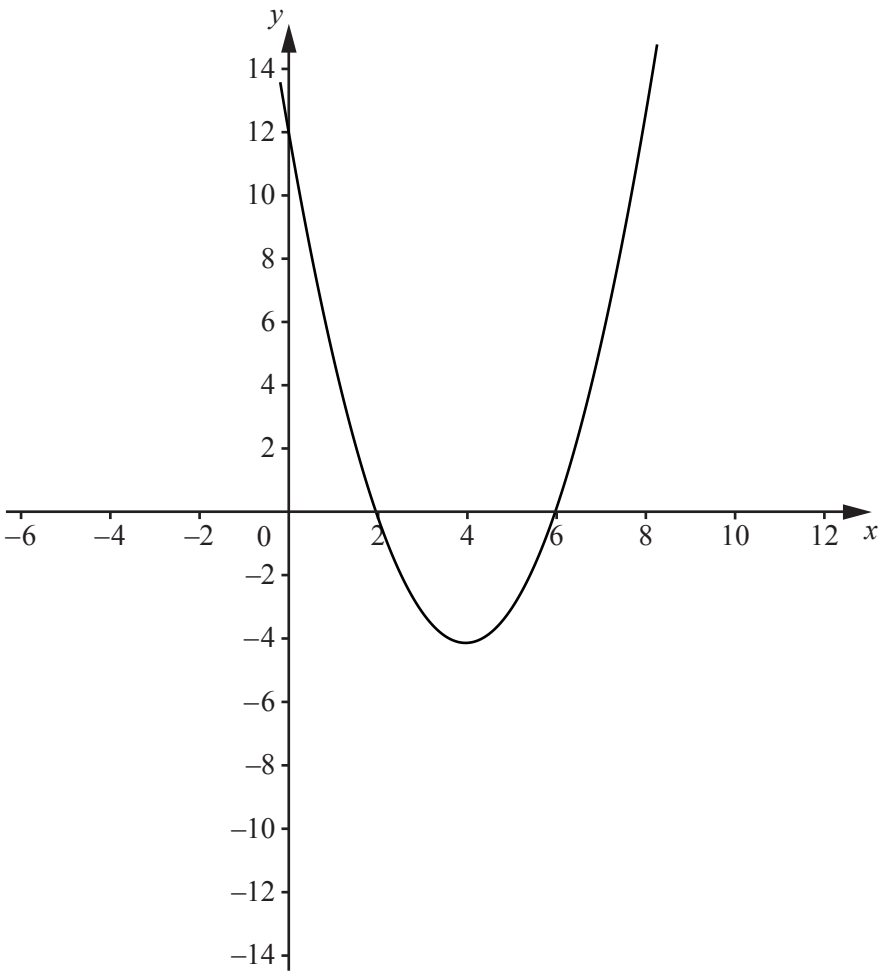
**(i)** Work out the value of $y$.

$y =$ ..... [1]

**(ii)** Find the area of garden used for the square run.

.....$m^2$ [1]

**6**




The diagram shows the graph of $y = f(x)$.

**(a)** Write down the zeros of $y = f(x)$.

$x =$ ..... or $x =$ ..... [1]

**(b)** On the diagram, draw the line of symmetry of $y = f(x)$. [1]

**(c)** Write down the co-ordinates of the $y$-intercept.

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

**(d)** On the diagram

**(i)** sketch the image of the graph of $y = f(x)$ after reflection in the $x$-axis, [1]

**(ii)** sketch the graph of $y = f(x) + 2$, [1]

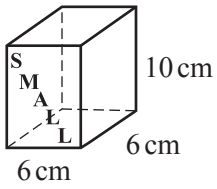
**(iii)** sketch the graph of $y = f(x + 3)$. [1]

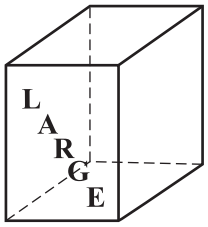
**7** **(a)** Joska and Sem go to the cinema to see a film.
The film starts at 15 45 and lasts for 1 hour 53 minutes.

Work out the time that the film ends.

..... [1]

**(b)**




NOT TO SCALE

The cinema shop sells popcorn in small boxes and large boxes.
Each box is a cuboid and the cuboids are mathematically similar.
The small box has dimensions 6 cm by 6 cm by 10 cm.
The ratio of dimensions small box : large box = 2 : 3.

Work out the dimensions of a large box.

..... cm by ..... cm by ..... cm [2]

**(c)** Find the volume of a small box and the volume of a large box.

small box = .....$cm^3$

large box = .....$cm^3$ [2]

**(d)** A small box of popcorn costs \$2.50 and a large box of popcorn costs \$4.00 .

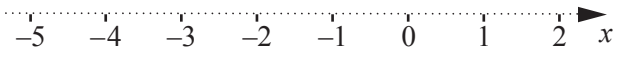
Find which box of popcorn is the better value.
Show all your working.

..... [2]

**(e)** Write your answers to **part (c)** as a ratio in its simplest form.

volume of small box : volume of large box = ..... : ..... [1]

**8** **(a)** Show $x > -2$ on the number line.




[1]

**(b)** Solve.

**(i)** $\frac{x}{3} = 5$

$x =$ ..... [1]

**(ii)** $11x - 9 = 13$

$x =$ ..... [2]

**(c)** Expand and simplify.

$(2x + 7)(x - 3)$

..... [2]

**(d)** Factorise completely.

$2xy - 6y^2$

..... [2]

**(e)** Simplify fully.

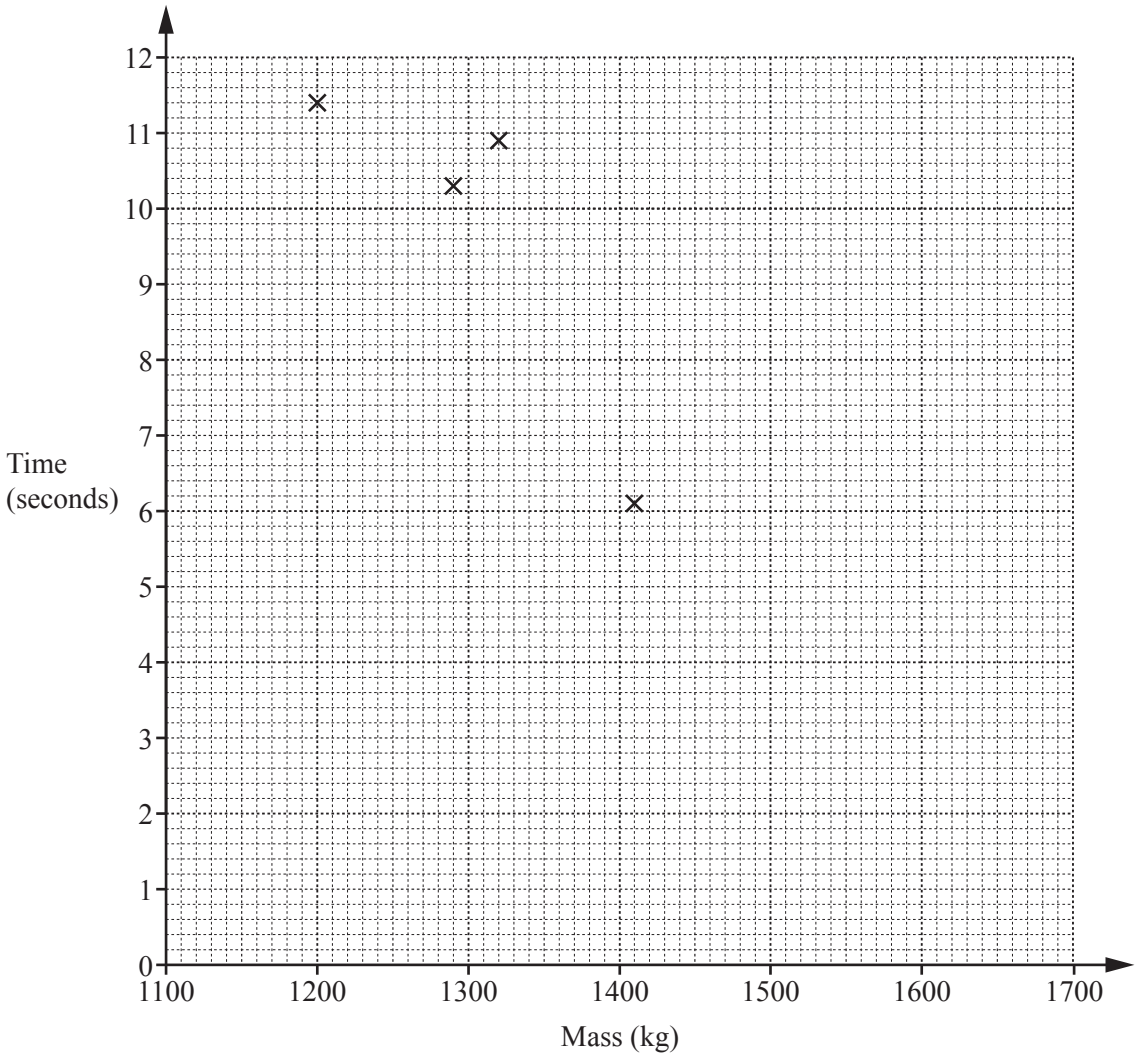
$4x^5 \times 7x^3$

..... [2]

**9** The mass of each of eight cars, in kg, and the time taken, in seconds, each takes to reach a speed of 100 km/ is recorded.

| Mass (kg) | 1200 | 1290 | 1320 | 1410 | 1430 | 1490 | 1580 | 1650 |
|---|---|---|---|---|---|---|---|---|
| Time (seconds) | 11.4 | 10.3 | 10.9 | 6.1 | 7.0 | 4.4 | 4.2 | 3.9 |

**(a)** Complete the scatter diagram.
The first four points have been plotted for you.




[2]

**(b)** Write down the type of correlation shown in the scatter diagram.

..... [1]

**(c)** **(i)** Find the mean mass.

..... kg [1]

**(ii)** Find the mean time.

..... seconds [1]

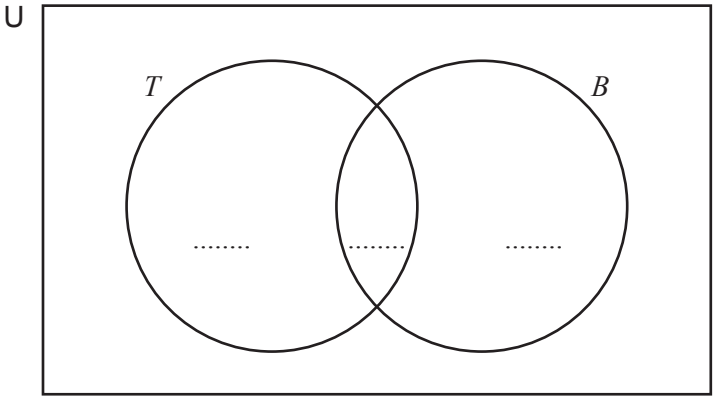
**(iii)** On the scatter diagram, draw a line of best fit. [2]

**(d)** Use your line of best fit to find an estimate of the time taken to reach 100 km/h for a car that has a mass of 1550 kg.

..... seconds [1]

**10** Some students are asked if they travel to school by tram ($T$) or bicycle ($B$) or both.
17 travel by tram, 14 travel by bicycle and 6 travel by both tram and bicycle.

**(a)** Show this information on the Venn diagram.




[2]

**(b)** The total number of students asked is 30.

Work out the number of students who do not travel to school by tram or bicycle or both.

..... [1]

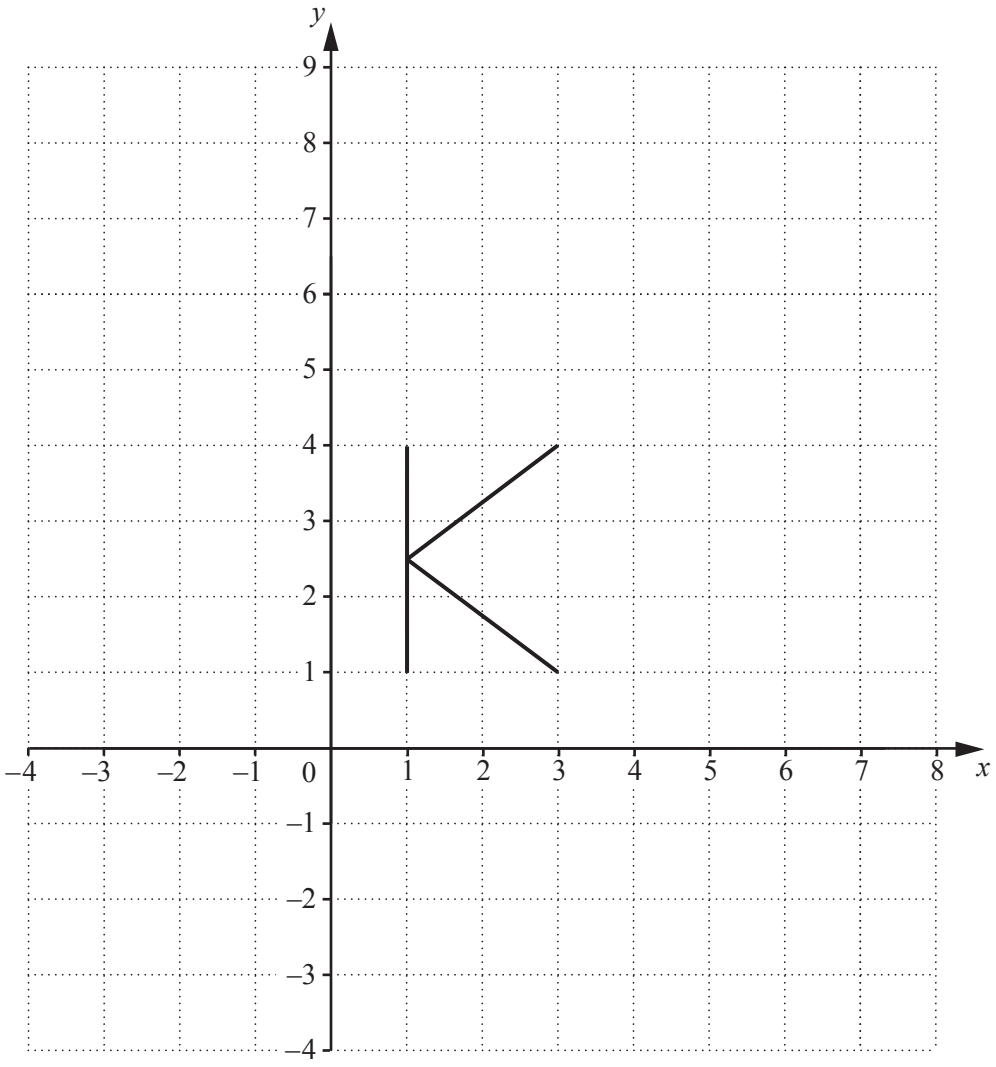
**(c)** One of the 30 students is chosen at random.

Find the probability that this student travels to school by bicycle and not by tram.

..... [1]

**(d)** On the Venn diagram, shade the region $(T \cup B)'$. [1]

**11** The shape, K, is shown on the diagram.



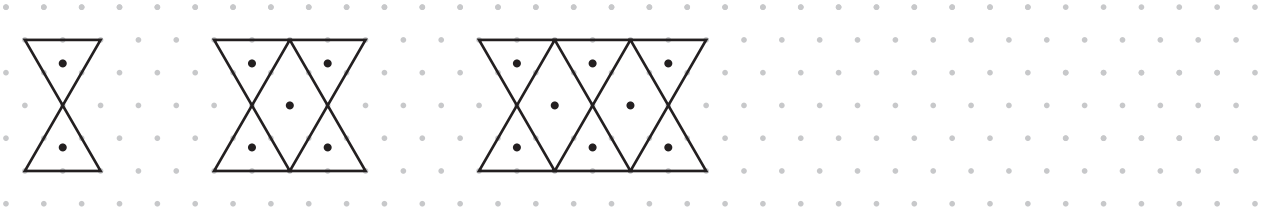

On the diagram, draw the image of K after

**(a)** a rotation of 180° about the origin, [2]

**(b)** a translation by the vector $\begin{pmatrix} 1 \\ -3 \end{pmatrix}$, [2]

**(c)** an enlargement, scale factor 2, with centre (0, 0). [2]

**12** Here is a sequence of patterns.



Pattern 1 Pattern 2 Pattern 3 Pattern 4

**(a)** In the space above, draw Pattern 4. [1]

**(b)** Complete the table.

| Pattern number | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Number of dots | 2 | | | | |

[2]

**(c)** Write down the rule for continuing the sequence of numbers of dots.

..... [1]

**(d)** Find an expression for the $n$th term of the sequence of numbers of dots.

..... [2]

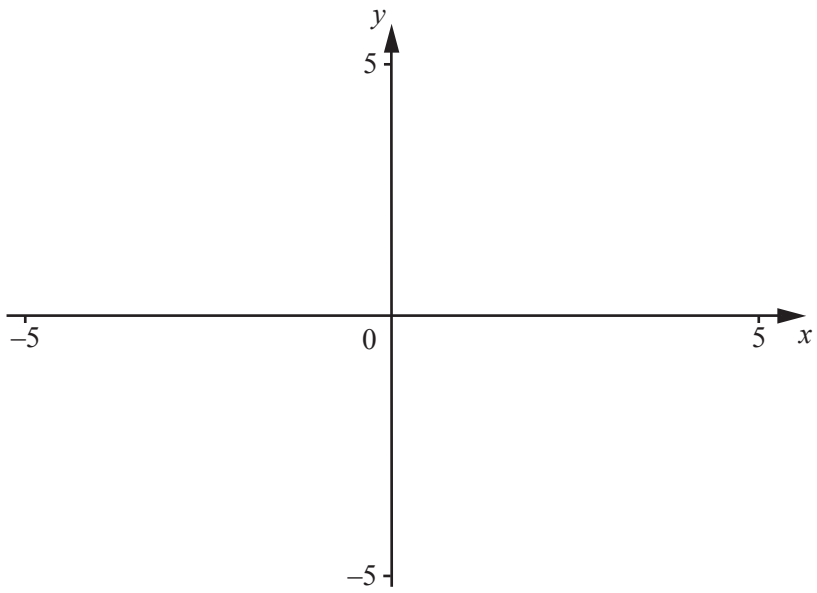
**(e)** Zoe thinks that 134 is a term in this sequence.

Is she correct?
Show how you decide.

..... because ..... [2]

**Question 13 is printed on the next page.**

**13**




$f(x) = \frac{2}{x}$

**(a)** On the diagram, sketch the graph of $y = f(x)$ for values of $x$ between $-5$ and 5. [2]

**(b)** Write down the equation of the vertical asymptote.

..... [1]

**(c)** On the same diagram, sketch the graph of $y = \frac{x}{2}$ for $-5 \leqslant x \leqslant 5$. [2]

**(d)** Find the values of $x$ when $\frac{2}{x} = \frac{x}{2}$.

$x =$ ..... or $x =$ ..... [2]