Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

7038247213

MATHEMATICS **0580/32**

Paper 3 (Core) **October/November 2015**

2 hours

Candidates answer on the Question Paper.

Additional Materials: Electronic calculator, Geometrical instruments, Tracing paper (optional)

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.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
If working is needed for any question it must be shown below that question.
Electronic calculators should be used.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.
For π, use either your calculator value or 3.142.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.
The total of the marks for this paper is 104.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **15** printed pages and **1** blank page.

DC (LK/SW) 106109/2

CAMBRIDGE International Examinations

[Turn over

1 **(a)** Write down in figures the number twenty one million.

Answer(a) .... [1]

(b) Write down the four factors of 21.

Answer(b) .... , ... , ... , ... [2]

(c) Write 21% as a fraction.

Answer(c) .... [1]

(d) Put brackets in this calculation to make it correct.

$$210 + 21 \div 2.1 + 21 = 10$$

[1]

(e) Write down the first two prime numbers after 21.

Answer(e) .... and .... [2]

(f) Fill in the missing number.

$$\frac{21}{210} = \frac{210}{\ldots\ldots}$$

[1]

(g) Calculate $21^2 - \sqrt{21}$.

Answer(g) .... [1]

(h) Work out $(\sqrt{21})^2$.

Answer(h) .... [1]

(i) Write down the value of 21^0.

Answer(i) .... [1]

(j) Write 0.0021 in standard form.

Answer(j) .... [1]

(k) Write down the lowest common multiple (LCM) of 21 and 15.

Answer(k) .... [2]

2 Here are the first four diagrams in a sequence.

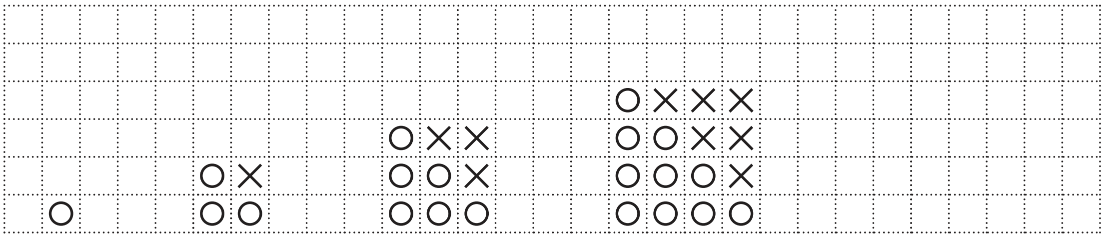


Diagram 1 Diagram 2 Diagram 3 Diagram 4 Diagram 5

(a) On the grid, draw Diagram 5. [1]

(b) Complete the table below for Diagram 4 and Diagram 5.

Diagram number	Number of Os	Number of Xs	Total number of Os and Xs
1	1	0	1
2	3	1	4
3	6	3	9
4			
5			

[2]

(c) Find an expression, in terms of *n*, for the total number of Os and Xs in Diagram *n*.

Answer(c) .... [1]

(d) Find the total number of Os and Xs in Diagram 23.

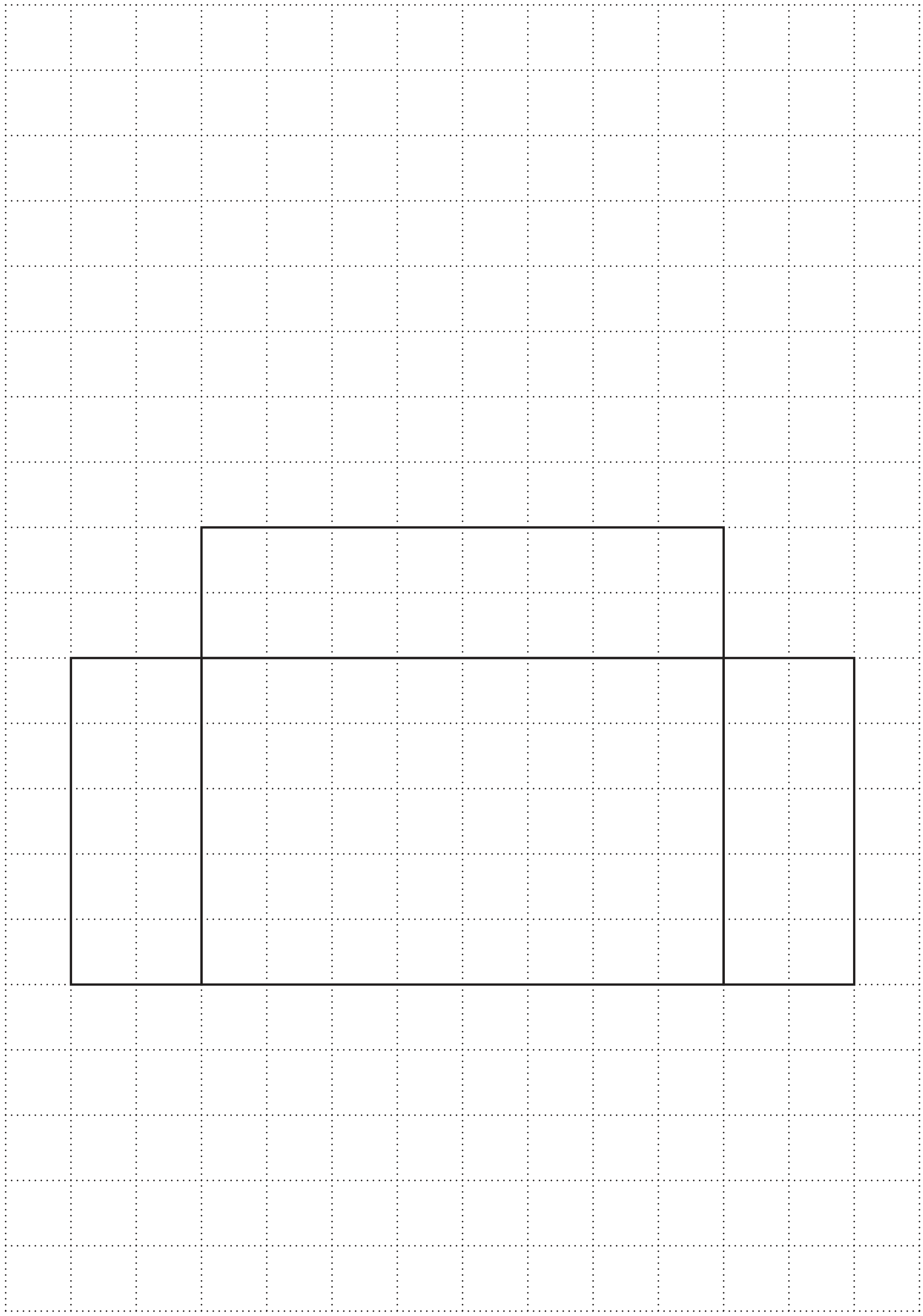
Answer(d) .... [1]

(e) Describe in words the rule for continuing the sequence for the number of Os.

1, 3, 6, …

Answer(e) .... [1]

3 **(a)**



The diagram shows part of a net for a cuboid drawn on a 1 cm^2 grid.

(i) Complete the diagram for the net of the cuboid. [1]

(ii) Calculate the surface area of the cuboid.

Answer(a)(ii)... cm^2 [2]

(iii) Calculate the volume of the cuboid.
Give the units of your answer.

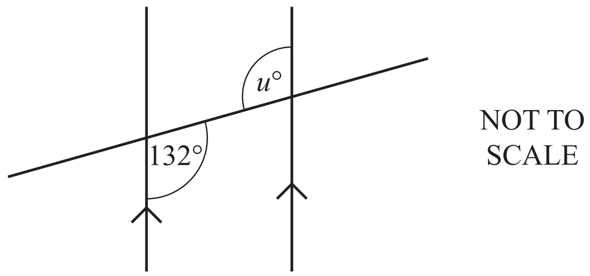
Answer(a)(iii)................................. .... [3]

(b) A different cuboid has volume $60\,cm^3$.
Its sides are all integer lengths.
All of its sides have length greater than 1 cm.
The length of one of its sides is a square number.

Write down the dimensions of the cuboid.

Answer(b) .... cm by .... cm by .... cm [2]

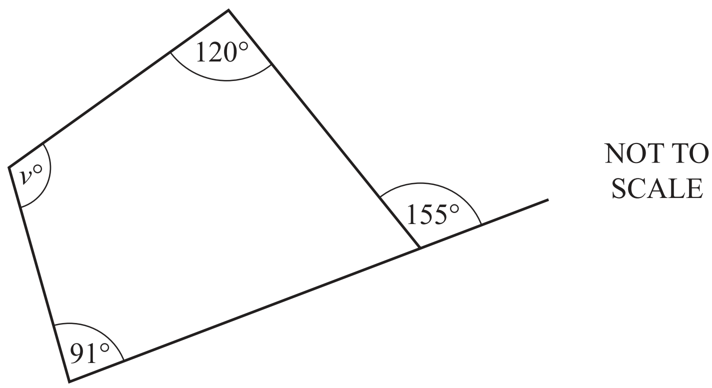
4 **(a)**



Find the value of *u*.

Answer(a) u = ... [1]

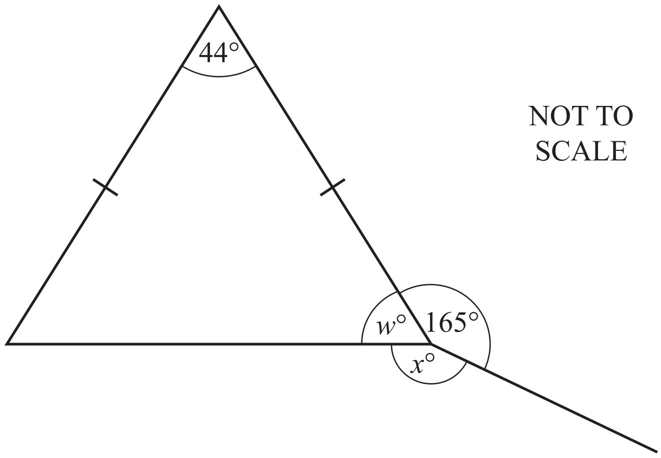
(b)



Find the value of *v*.

Answer(b) v = ... [2]

(c)



(i) Write down the mathematical name for this triangle.

Answer(c)(i) .... [1]

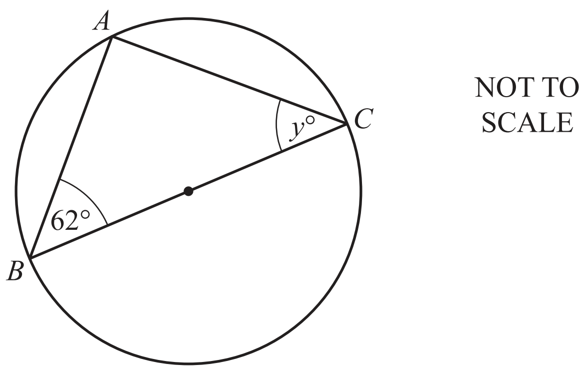
(ii) Find the value of *w*.

Answer(c)(ii) w = ... [1]

(iii) Find the value of *x*.

Answer(c)(iii) x = ... [1]

(d)



A, *B* and *C* lie on a circle with diameter *BC*.

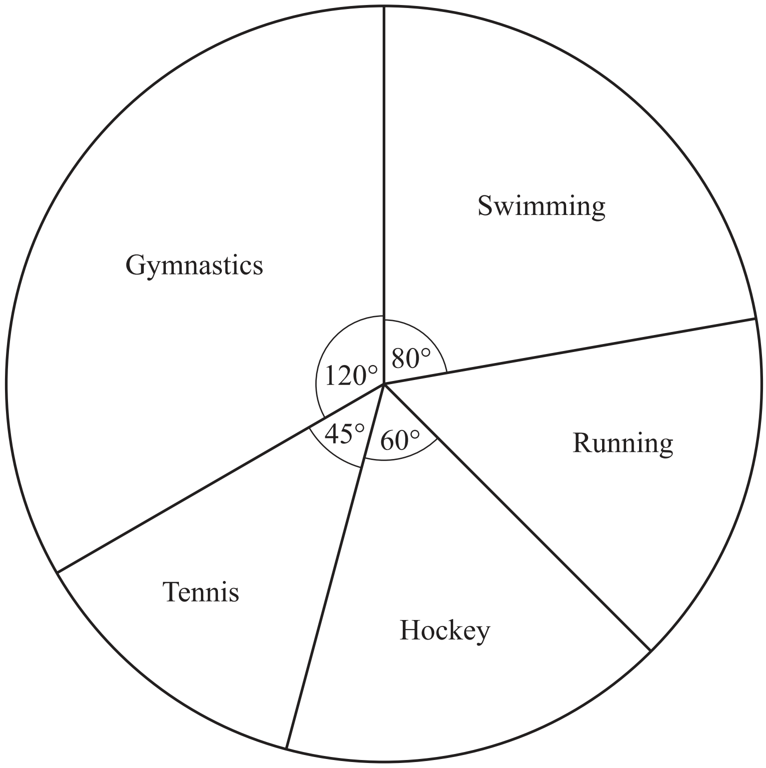
(i) Find the value of *y*.

Answer(d)(i) y = ... [2]

(ii) Write down the mathematical name for the straight line *AB*.

Answer(d)(ii) .... [1]

5 **(a)** Some children are asked what their favourite sport is.
The results are shown in the pie chart.



(i) Complete the statements about the pie chart.

The sector angle for running is .... degrees.

The least popular sport is ....

$\frac{1}{6}$ of the children chose ....

Twice as many children chose .... as .... [4]

(ii) Five more children chose swimming than hockey.

Use this information to work out the number of children who chose gymnastics.

Answer(a)(ii) .... [3]

(b) Ten boys go swimming.
The teacher records, in seconds, the time each boy takes to

- get ready for swimming
- swim one length.

These times are shown in the table below.

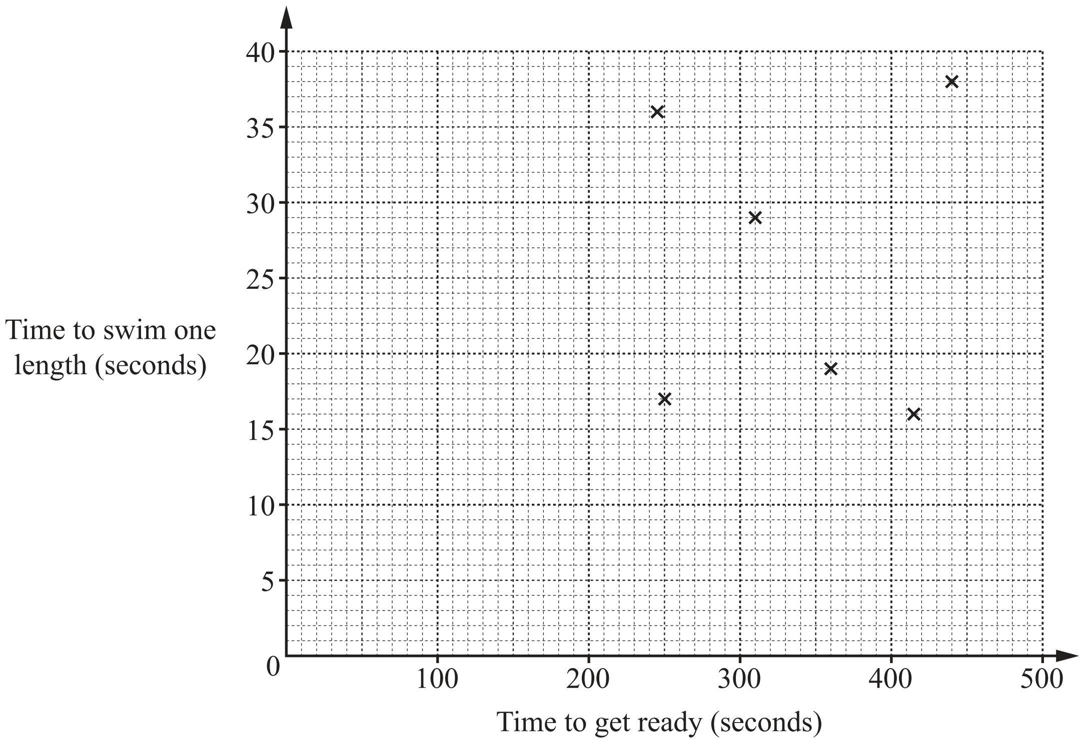
Boy	A	B	C	D	E	F	G	H	I	J
Time to get ready	310	250	360	245	440	415	290	420	480	400
Time to swim one length	29	17	19	36	38	16	40	32	20	30

(i) A boy is chosen at random.

Find the probability that he takes more than 300 seconds to get ready.

Answer(b)(i) .... [1]

(ii) Complete the scatter diagram.
The first six points have been plotted for you.



[2]

(iii) Another boy takes 340 seconds to get ready.

Can the scatter diagram be used to estimate the time it will take him to swim one length?
Give a reason for your answer.

Answer(b)(iii).......................... because ....

.... [1]

6 A sweet shop sells lots of different types of sweets.

(a) (i) Each large bag of mixed sweets is divided in the ratio mints : jellies : toffees = 5 : 2 : 8.
Each large bag has a total of 180 sweets.

Calculate the number of sweets of each type in a large bag.

Answer(a)(i) Mints = ...

Jellies = ...

Toffees = ...[3]

(ii) The mass, m grams, of a small bag of sweets is 75 g, correct to the nearest gram.

Complete the statement about the value of m.

Answer(a)(ii)……………. $\leqslant m <$ ………….. [2]

(b) There are 156 g of sugar in a 240 g bar of chocolate.

(i) Write 156 as a percentage of 240.

Answer(b)(i) .... % [1]

(ii) Work out the number of grams of sugar in a 1.2 **kilogram** bar of chocolate.

Answer(b)(ii) .... g [2]

(iii) Another bar of chocolate is made.
The mass is 35% greater than the 240 g bar.

Work out the mass of this chocolate bar.

Answer(b)(iii) .... g [2]

(c) A girl buys a large piece of fudge.
She eats $\frac{3}{10}$ herself and divides the rest equally between 4 friends.

Work out the fraction of this fudge that each friend receives.

Answer(c) .... [2]

(d) Gabriella and Max buy some bags of mints and some bags of toffees from the shop.
The cost of one bag of mints is m **cents** and the cost of one bag of toffees is t **cents**.

(i) Gabriella buys 3 bags of mints and 5 bags of toffees for \$4.70 .

Complete the equation.

$3m + 5t =$ .... [1]

(ii) Max buys 4 bags of mints and 3 bags of toffees for \$3.70 .

Write this information as an equation.

Answer(d)(ii) .... = ... [2]

(iii) Solve your two equations to find the cost of a bag of mints and the cost of a bag of toffees.
You must show all your working.

Answer(d)(iii) Cost of a bag of mints = ... cents

Cost of a bag of toffees = ... cents [4]

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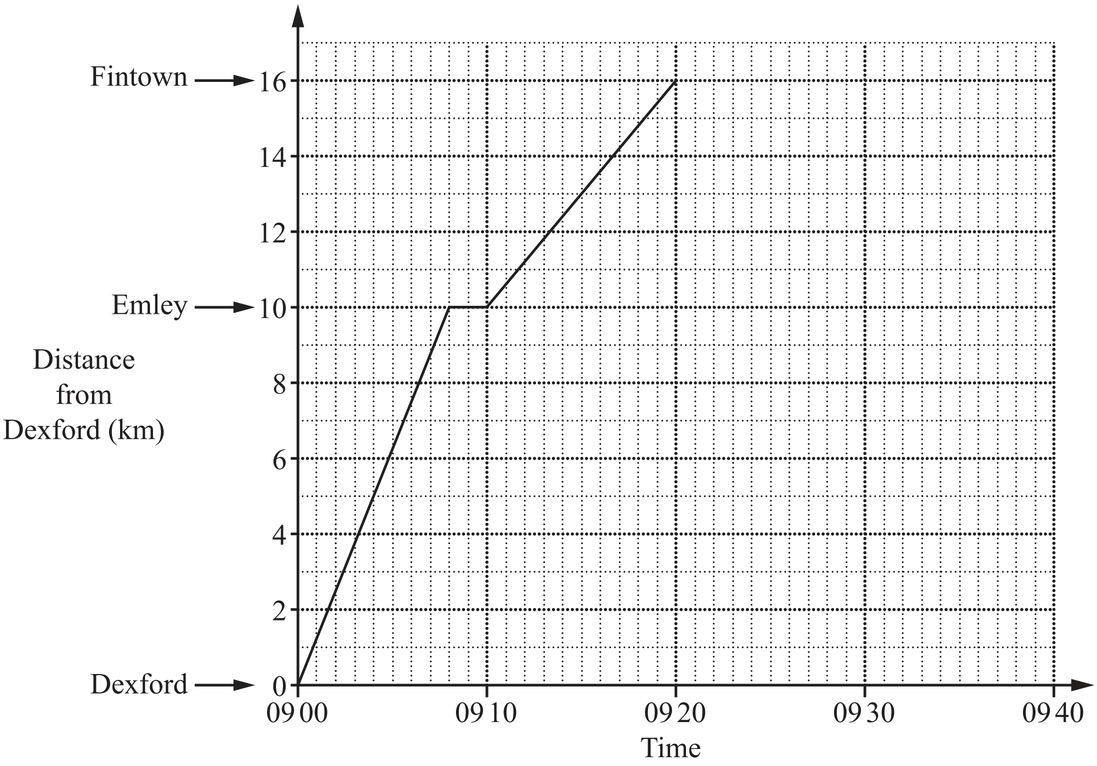

The grid shows the travel graph for a train travelling from Dexford to Fintown, stopping at Emley.

(a) **(i)** Write down the distance the train travels in the first 8 minutes.

Answer(a)(i) .... km [1]

(ii) Calculate the average speed, in kilometres per hour, for the journey from Dexford to Fintown.

Answer(a)(ii) .... km/h [3]

(b) The train waits at Fintown for 4 minutes.
The train then returns to Dexford without stopping at Emley.
The return speed of the train is 80 km/h.

(i) Complete the travel graph. [2]

(ii) Change 80 km/h to metres per second.

Answer(b)(ii) .... m/s [2]

(c) Trains leave Dexford for Fintown every 75 minutes.
The train that leaves Dexford at 09 00 is the first train of the day.

Write down the time that the fourth train leaves Dexford for Fintown.

Answer(c) .... [2]

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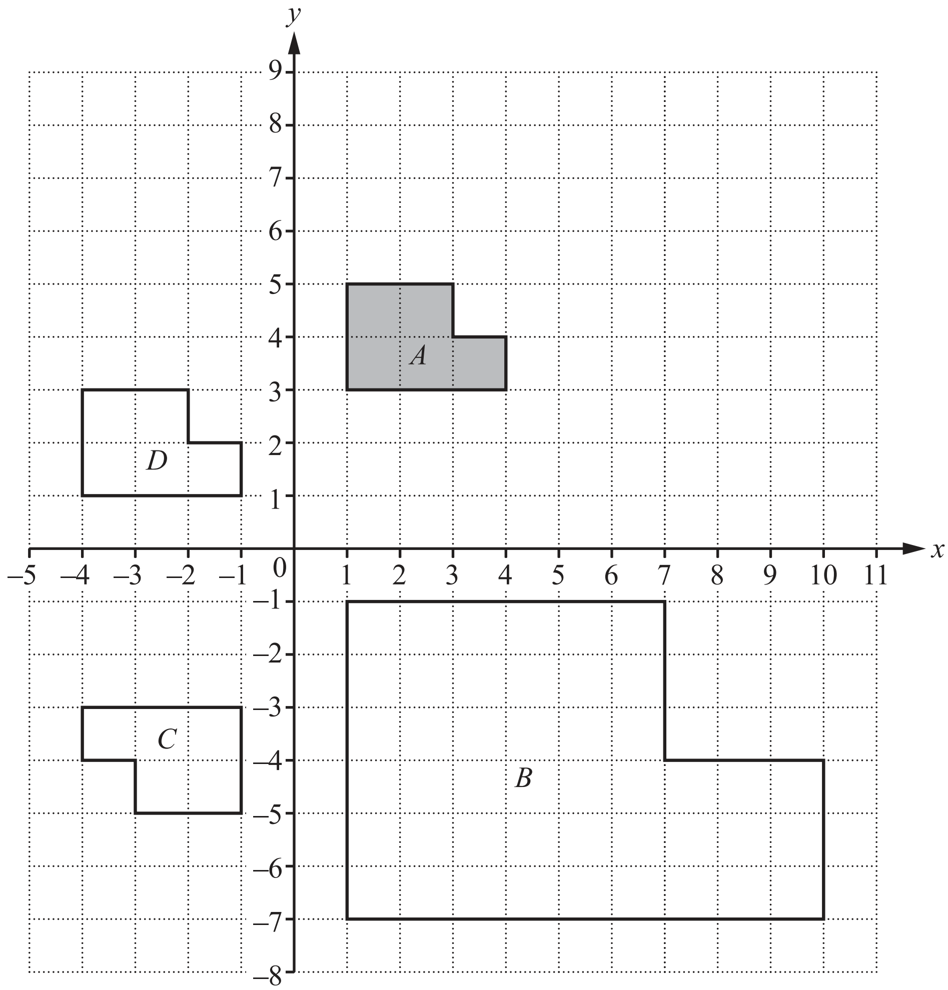

The diagram shows four shapes *A*, *B*, *C* and *D*.

(a) Describe fully the **single** transformation that maps shape *A* onto

(i) shape *B*,

Answer(a)(i) ....

.... [3]

(ii) shape *C*,

Answer(a)(ii) ....

.... [3]

(iii) shape *D*.

Answer(a)(iii) ....

.... [2]

(b) On the grid, draw the reflection of shape *A* in the line $x = 5$. [2]

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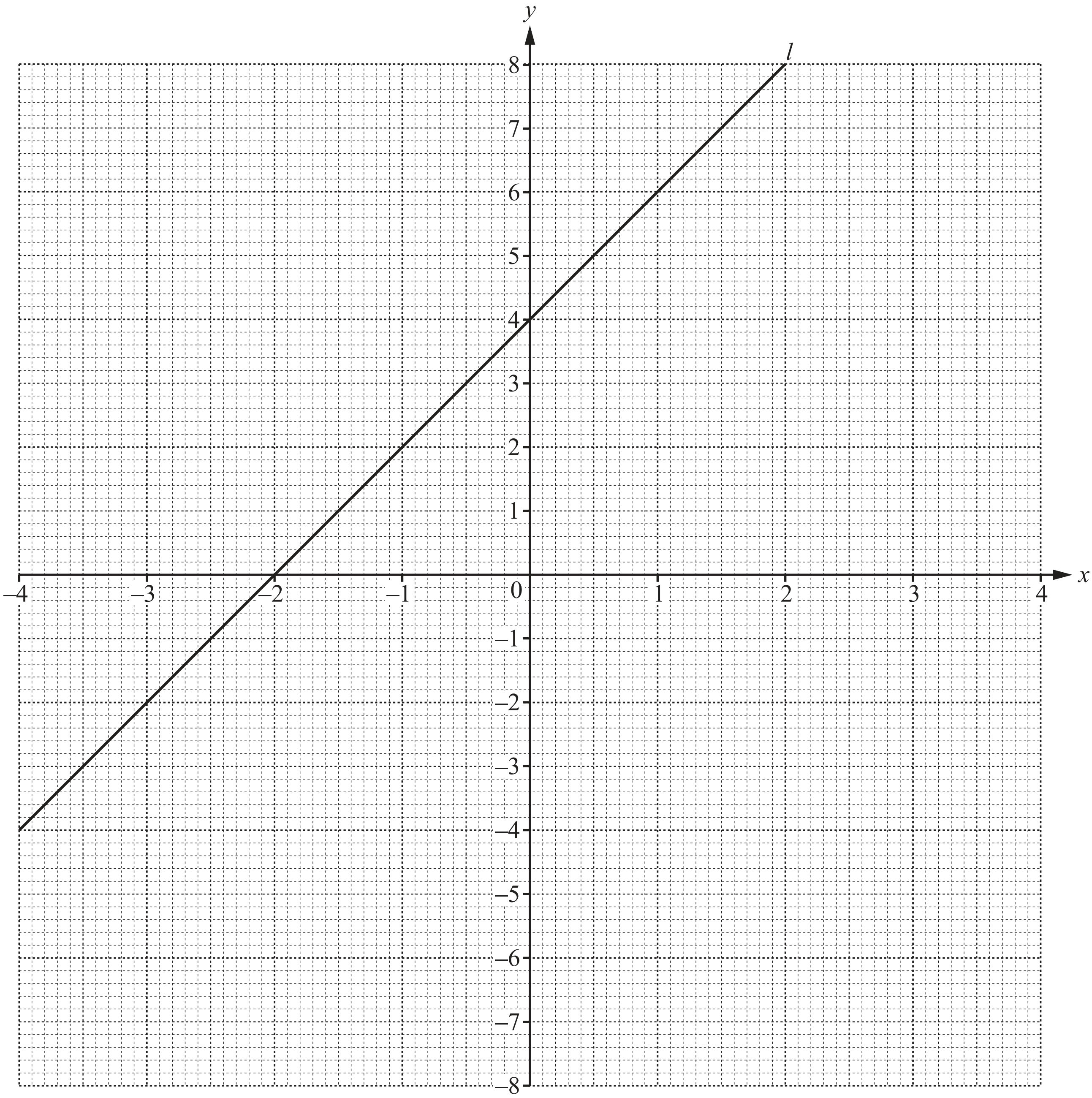

(a) Write down the equation of the line l in the form $y = mx + c$.

Answer(a) y = ... [3]

(b) Complete the table of values for $y = \dfrac{2}{x}$.

x	–4	–3	–2	–1	–0.5	–0.25		0.25	0.5	1	2	3	4
y		–0.7			–4				4			0.7	

[3]

(c) On the grid, draw the graph of $y = \dfrac{2}{x}$ for $-4 \leqslant x \leqslant -0.25$ and $0.25 \leqslant x \leqslant 4$. [4]

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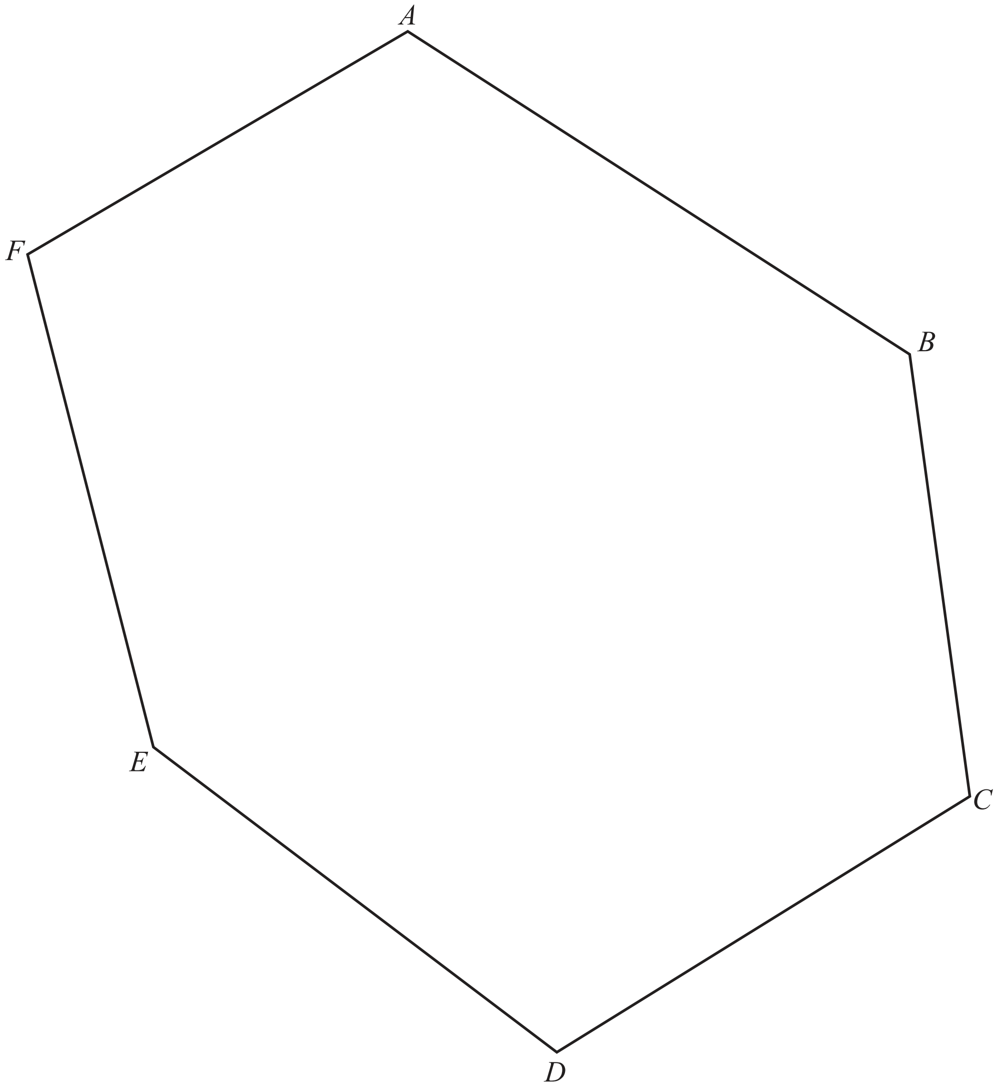

(a) **Complete this part of the question using a straight edge and compasses only.**
Show all your construction arcs.

(i) Construct the perpendicular bisector of *AB*. [2]

(ii) Construct the locus of points that are equidistant from *FA* and *FE*. [2]

(b) **Complete this part of the question using a ruler and compasses only.**

Shade the region inside the shape that is

- more than 5 cm from *D*

and

- less than 4 cm from *C*. [3]

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