

1 (a) Write down

(i) a square number between 30 and 40, [1]

(ii) the number three million, three hundred and thirty in figures, [1]

(iii) the next cube number after 64, [1]

(iv) the five factors of 16,
.....,,,, [2]

(v) a common multiple of 6 and 8, [1]

(vi) a prime number between 20 and 30. [1]

(b) Write 567.4892 correct to

(i) the nearest ten, [1]

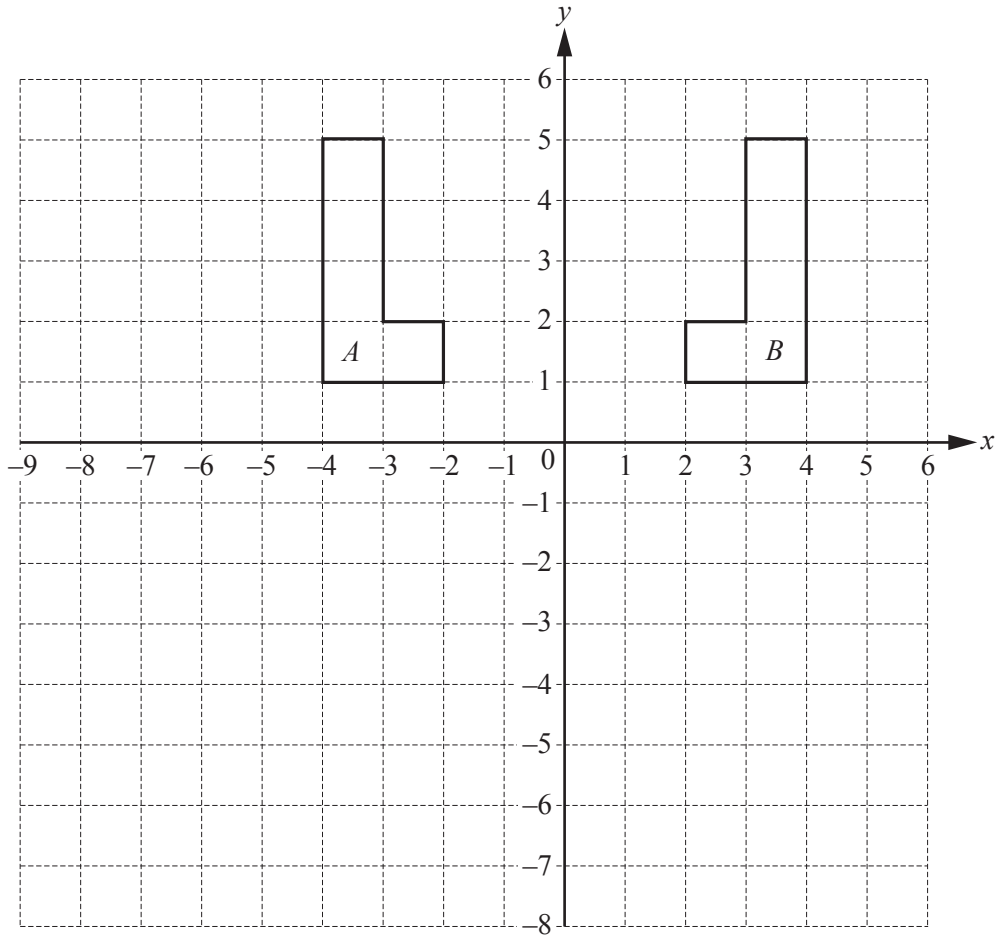
(ii) 2 decimal places. [1]

(c) Complete these calculations.

(i) $4 + 6 \div 2 = \dots\dots\dots$ [1]

(ii) $(8 - 20) \div \dots\dots\dots = 4$ [1]

(iii) $6432 \times \dots\dots\dots = 64.32$ [1]



The diagram shows two shapes *A* and *B*.

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

..... [2]

- (b) (i) Reflect **shape B** in the line $y = 0$ and label this shape *C*. [2]

- (ii) Describe fully the **single** transformation that maps **shape A** onto shape *C*.

..... [3]

- (c) (i) Enlarge **shape A** by scale factor 3, centre $(-2, 5)$. Label this shape *D*. [2]

- (ii) How many times bigger is the area of shape *D* than the area of shape *A*?

..... [2]

- 3 Mrs Singh and Mr Patel are teachers.
They take their two classes to the theatre to see a play.

- (a) (i) Mrs Singh has 20 girls in her class.
The ratio of girls : boys = 5 : 3.

Show that Mrs Singh has 32 students in her class.

[2]

- (ii) Mr Patel has 40 students in his class.
The ratio of girls : boys = 3 : 2.

For the 72 students in the two classes, work out the ratio of

total number of girls : **total** number of boys.

Give your answer in its simplest form.

..... : [4]

(b)

Ticket price	
Student	\$5.75
Teacher	\$8.25
For every 25 students, one teacher receives a free ticket.	

Four teachers go to the theatre with the 72 students.

Calculate the total cost of the tickets.

\$ [3]

- (c) The play is in three parts.
Each part lasts for 45 minutes.
There is a 20 minute interval between each part.
The first part starts at 13 30.

Work out the time that the play ends.

..... [2]

- (d) Mr Patel pays \$3.60 for a programme.
Last year, the price of a programme was \$3.20 .

Calculate the percentage increase in the price of a programme.

..... % [3]

- (e) The probability that a student loses their theatre ticket is $\frac{1}{18}$.

- (i) Write down the probability that a student does not lose their ticket.

..... [1]

- (ii) Work out how many of the 72 students you would expect to **lose** their ticket.

..... [1]

- 4 (a) Complete this statement.

To be obtuse, an angle must be between degrees and degrees.

[1]

- (b)

parallelogram	square	rectangle
kite	trapezium	rhombus

Choose one word from the box to complete each statement.

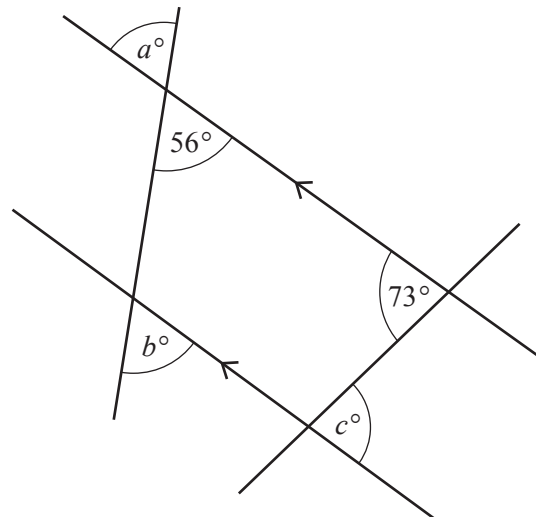
A has no lines of symmetry but has rotational symmetry of order 2.

A has two lines of symmetry but no right angles.

A has one line of symmetry but no rotational symmetry.

[3]

- (c)



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The diagram shows four straight lines.

Write down the values of a , b and c .

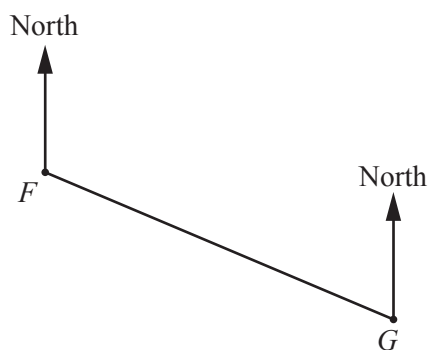
Give a geometrical reason for each answer.

$a =$ because

$b =$ because

$c =$ because [6]

- (d) The scale drawing shows the positions of two towns F and G .
The scale is 1 cm represents 1.5 km.



Scale: 1 cm to 1.5 km

- (i) Measure the bearing of G from F .
..... [1]
- (ii) Find the distance, in kilometres, between town F and town G .
..... km [1]
- (iii) Another town, H , is 10.5 km from town G .
The bearing of H from G is 174° .
On the scale drawing, mark the position of town H . [2]

- 5 A train departs from Green Hill, stops at Deep Valley for 5 minutes and then goes on to Clear Lake. The train timetable shows the times.

Station	Arrive	Depart
Green Hill	-	10 30
Deep Valley	10 45	10 50
Clear Lake	11 14	-

- (a) (i) Complete this statement.

The journey from Green Hill to Deep Valley takes minutes. [1]

- (ii) Write your answer to **part (a)(i)** as a fraction of an hour.

..... [1]

- (b) The train travels the 18 km between Green Hill and Deep Valley at a constant speed.

Calculate the speed, in km/h, for the train on this part of the journey.

..... km/h [1]

- (c) The train travels at a constant speed of 85 km/h between Deep Valley and Clear Lake.

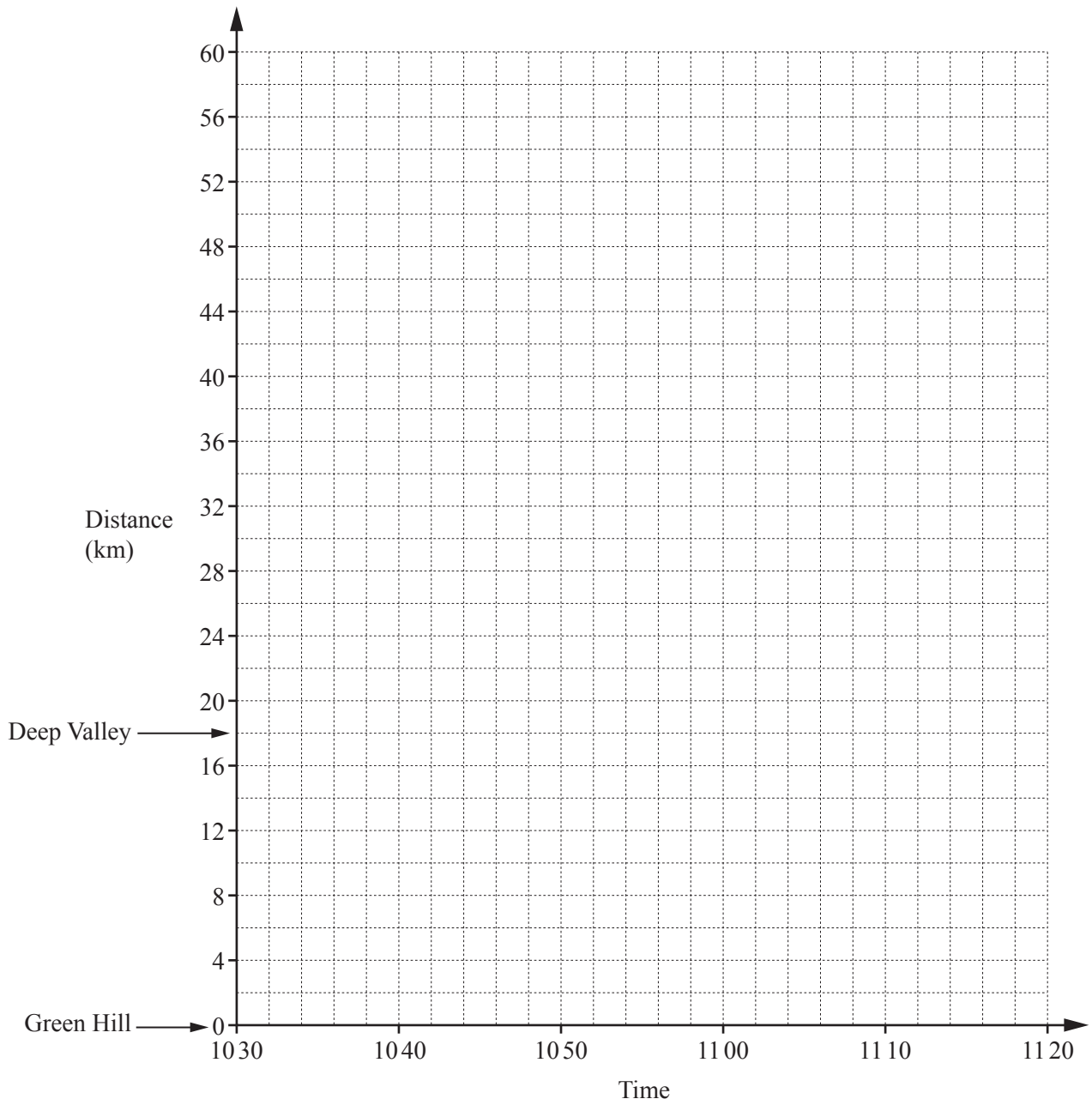
Work out the distance between Deep Valley and Clear Lake.

..... km [2]

- (d) Work out the total distance between Green Hill and Clear Lake.

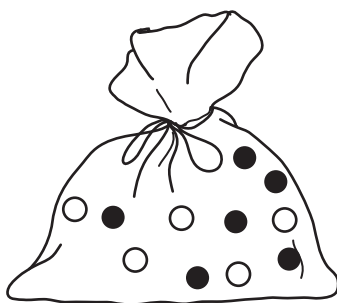
..... km [1]

(e) Complete the travel graph to show the whole journey from Green Hill to Clear Lake.



[3]

- 6 (a) A bag contains 5 white and 6 black marbles.



- (i) A marble is chosen at random from the bag and then replaced.

Write down the probability that the marble is black.

..... [1]

- (ii) Delilah adds some more black marbles to the bag.
The probability of choosing a black marble is now $\frac{2}{3}$.

How many black marbles did she add to the bag?

..... [2]

- (b) A white marble costs w cents and a black marble costs b cents.

- (i) 2 white marbles and 5 black marbles cost 155 cents.

Complete the equation.

$$2w + 5b = \text{.....} \quad [1]$$

- (ii) 3 white marbles and 10 black marbles cost 290 cents.

Write down an equation to show this information.

..... [1]

- (iii) Solve your two equations to find the value of w and the value of b .
You must show all your working.

$$w = \text{.....}$$

$$b = \text{.....} [3]$$

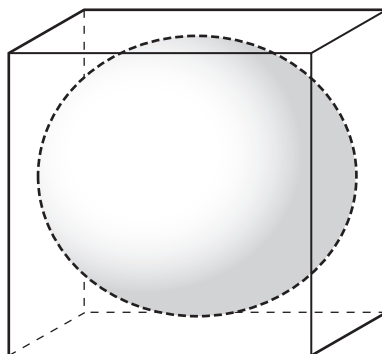
- (c) A black marble is weighed and its mass, m grams, is 35 g correct to the nearest 5 g.

Complete the statement about the value of m .

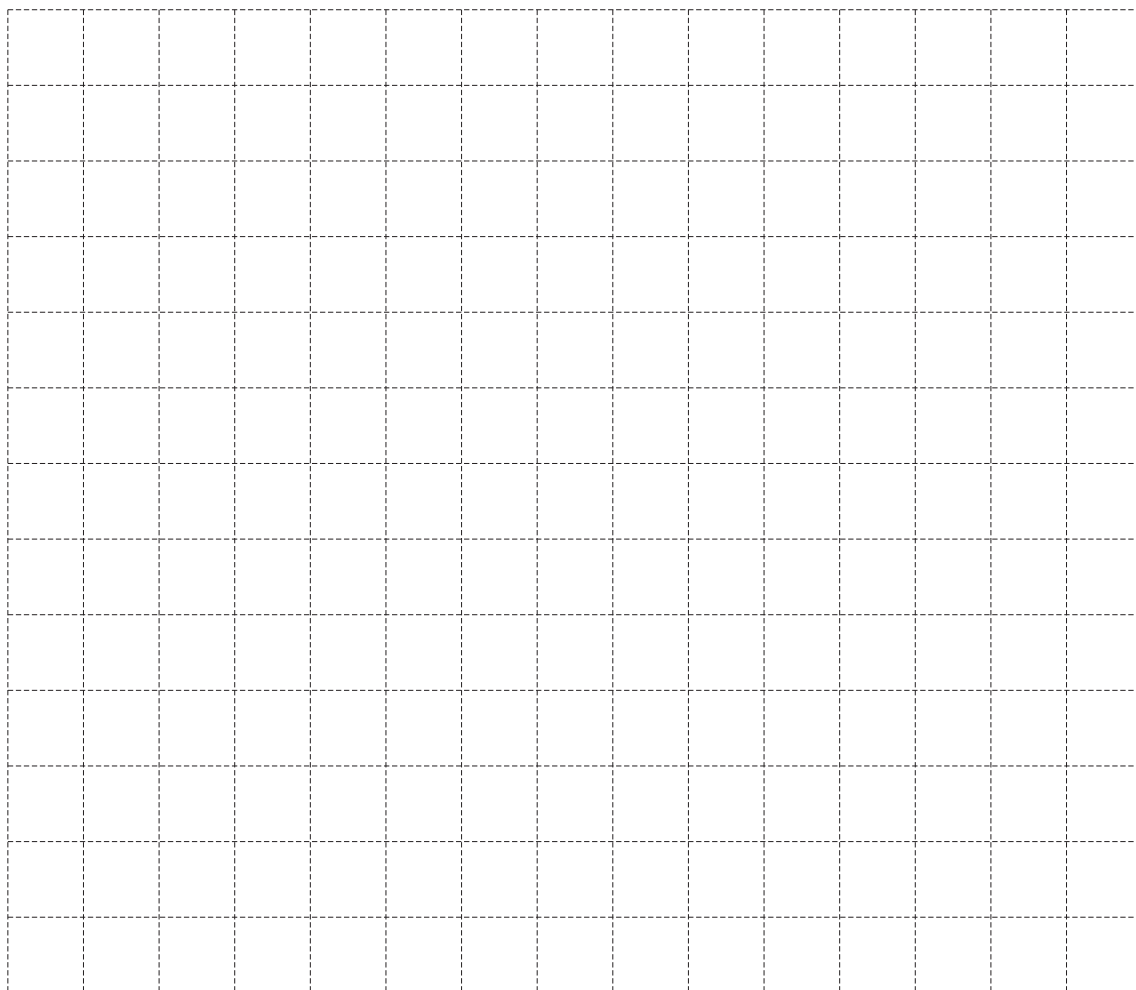
..... $\leq m <$ [2]

- (d) Each marble is a sphere of diameter 3 cm.

On the grid, draw an accurate net of the smallest closed box a marble can fit in.



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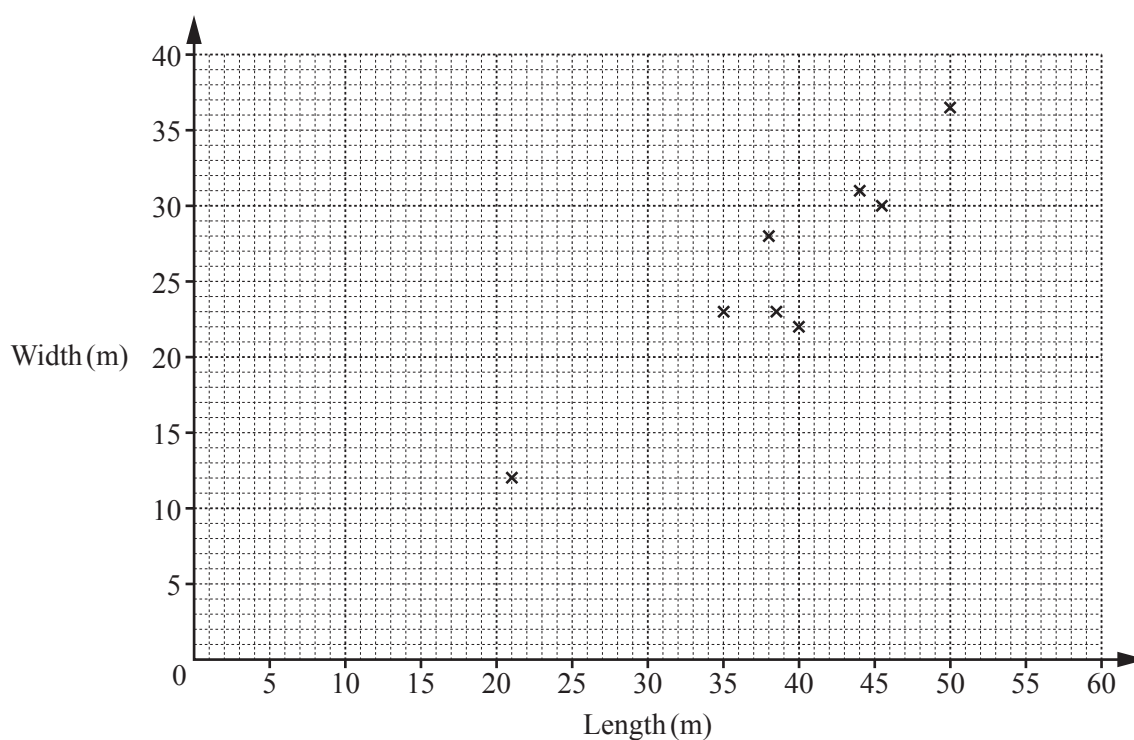


[2]

- 7 Ten students estimate the length and width of their rectangular school hall. The results are shown in the table.

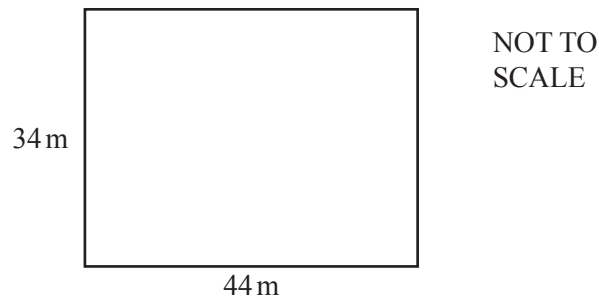
Student	A	B	C	D	E	F	G	H	I	J
Length (m)	35	50	38	45.5	21	38.5	40	44	45	26
Width (m)	23	36.5	28	30	12	23	22	31	35	18

The first 8 results have been plotted on the scatter diagram.



- (a) On the scatter diagram, plot the results for students I and J. [1]
- (b) What type of correlation is shown by this scatter diagram? [1]
- (c) (i) On the scatter diagram, draw a line of best fit. [1]
- (ii) Another student, Pedro, estimates the length of the hall as 31 m. His result for the width is missing.
- Use your line of best fit to estimate his result for the width. m [1]

- (d) The actual measurements of the hall are length 44 m and width 34 m.



- (i) The teacher says a 'good estimator' has both estimates no more than 5 m from the actual measurements.

Write down the letters of the students who are 'good estimators'.

..... [2]

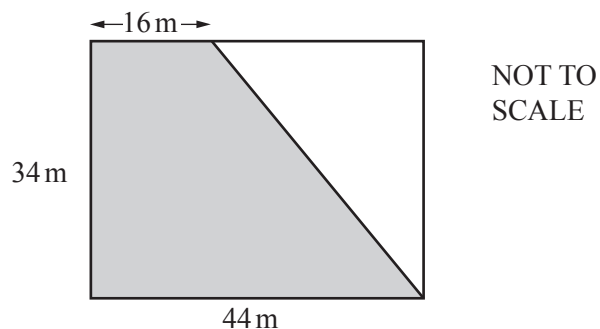
- (ii) Work out the perimeter of the hall.

..... m [1]

- (iii) Calculate the length of a diagonal of the hall.

..... m [2]

- (e) The hall is divided into two areas.

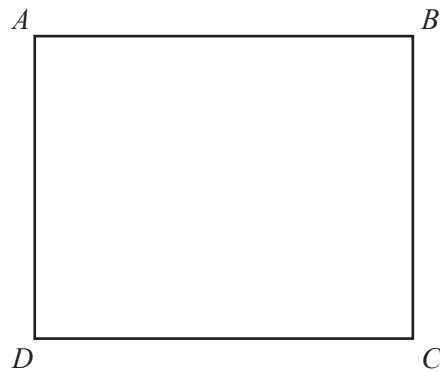


Find the shaded area.

..... m² [2]

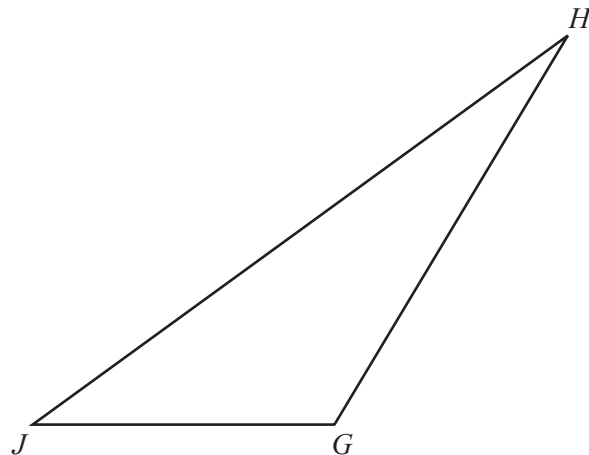
- 8 Complete parts (a)(i) and (b)(i) of this question using a straight edge and compasses only. Show all your construction arcs.

(a) $ABCD$ is a rectangle.



- (i) Construct the bisector of angle BAD . [2]
- (ii) Shade the region inside the rectangle that is closer to AB than to AD . [1]

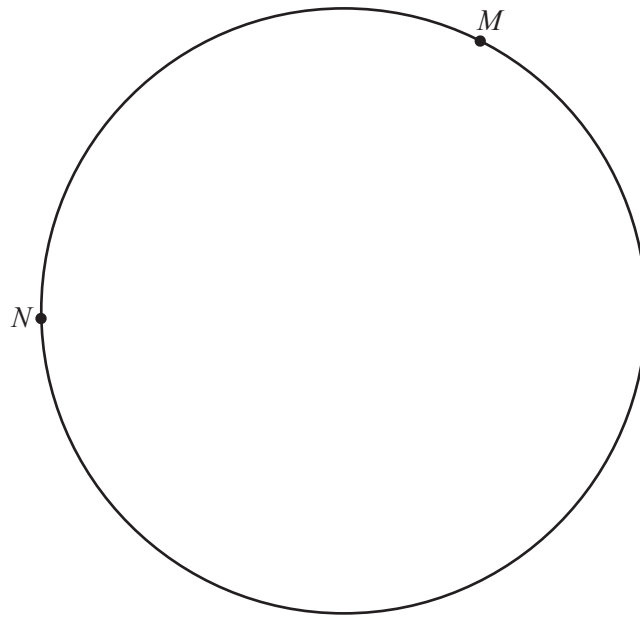
(b) GHJ is a triangle.



- (i) Construct the perpendicular bisector of GH . [2]
- (ii) Shade the region inside the triangle that is closer to G than to H . [1]
- (iii) Measure the reflex angle at H .

..... [1]

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



The points M and N lie on the circumference of a circle.

Shade the region inside the circle that is

- more than 5 cm from M
- and
- less than 4 cm from N .

[3]

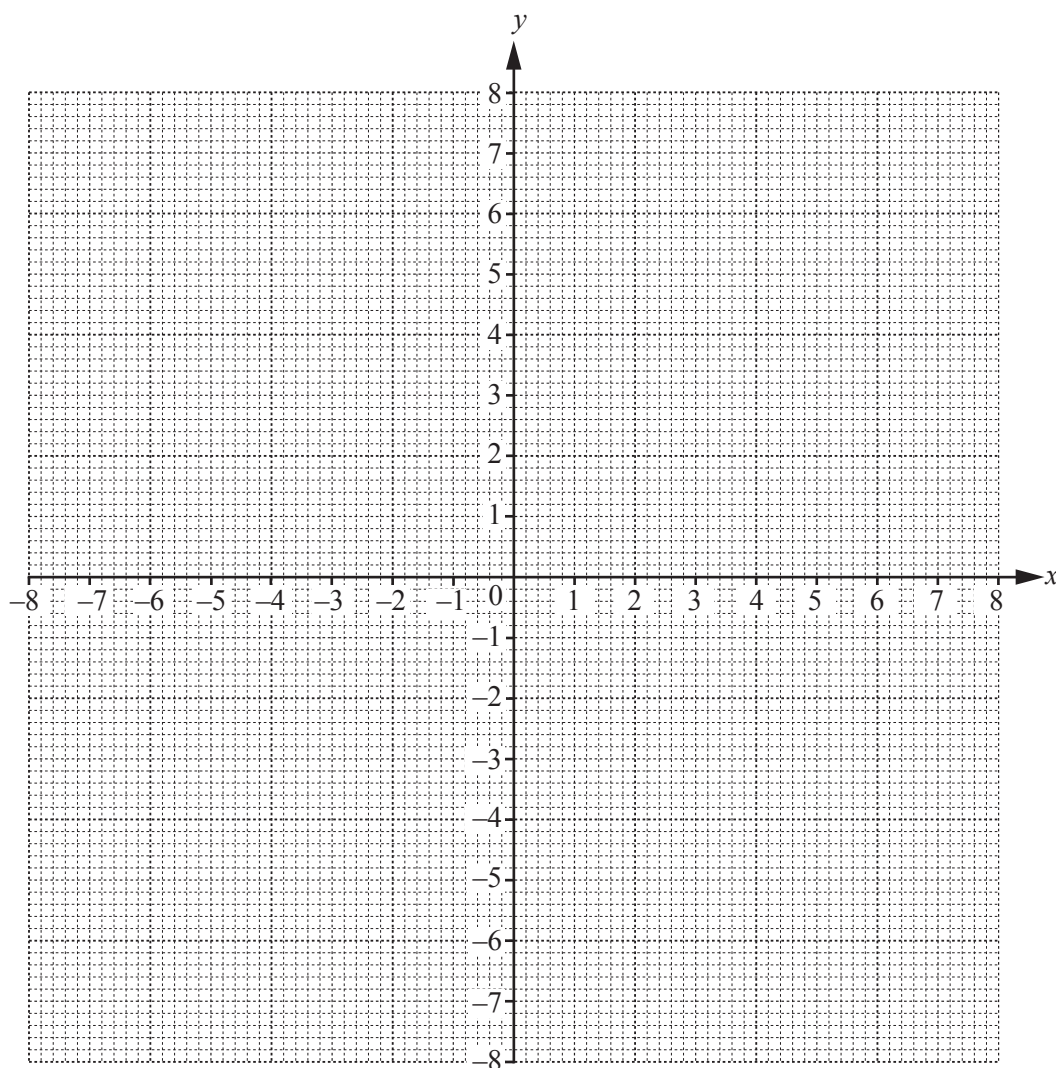
Question 9 is printed on the next page.

- 9 (a) Complete the table of values for $y = \frac{8}{x}$.

x	-8	-6	-4	-2	-1		1	2	4	6	8
y	-1	-1.3			-8				2	1.3	1

- (b) On the grid, draw the graph of $y = \frac{8}{x}$ for $-8 \leq x \leq -1$ and $1 \leq x \leq 8$.

[2]



- (c) The graph of $y = \frac{8}{x}$ has two lines of symmetry.
Write down the equation of each of these lines.

[4]

..... and [2]

- (d) Mark a point, P , on the graph of $y = \frac{8}{x}$ where the x and y co-ordinates are equal.

[1]

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