Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

7064186759

MATHEMATICS **0580/32**

Paper 3 (Core) **February/March 2017**

2 hours

Candidates answer on the Question Paper.

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

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.

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

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CAMBRIDGE International Examinations

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) $4 + 6 \div 2 =$ .....

[1]

(ii) $(8 - 20) \div$ ..... $= 4$

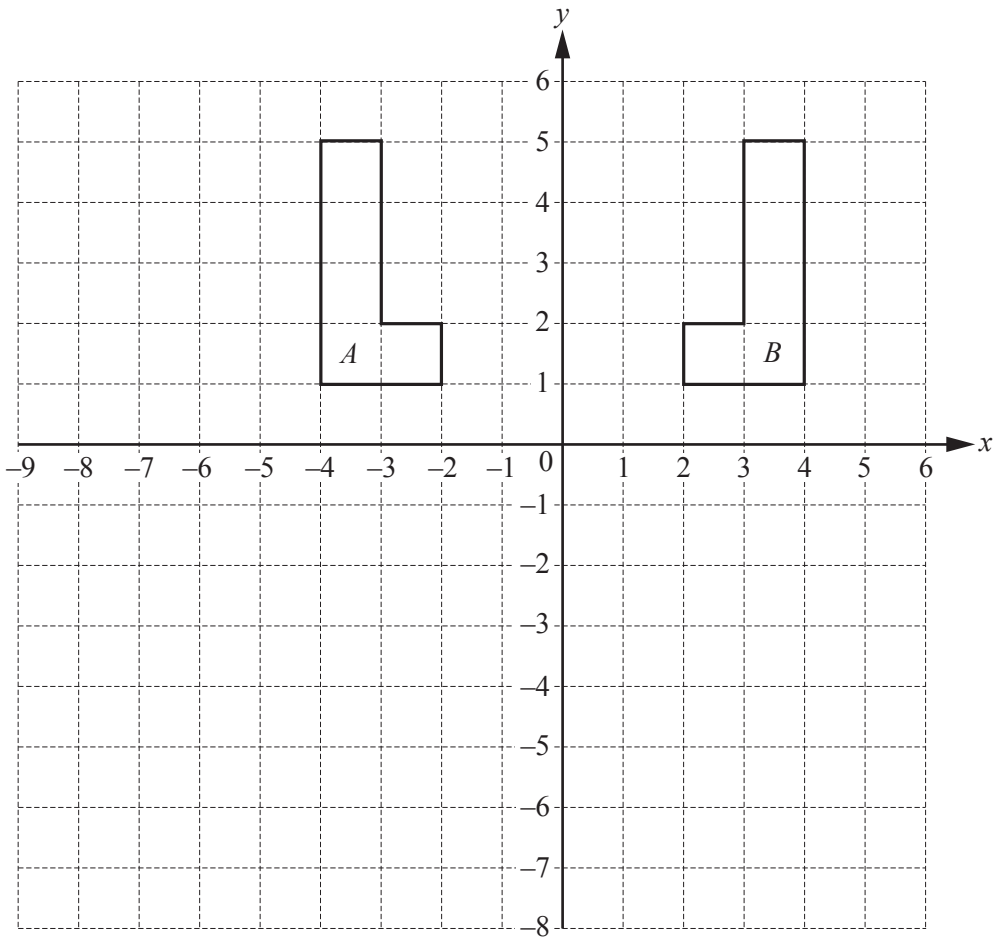
[1]

(iii) $6432 \times$ ..... $= 64.32$

[1]

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2



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]

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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]

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(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

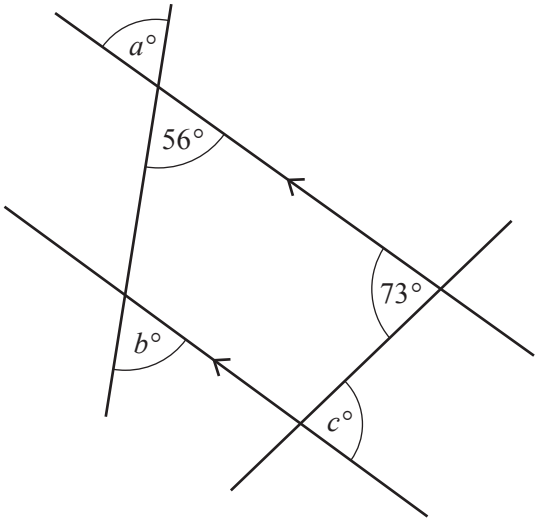
Choose one word from the box to complete each statement.

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.

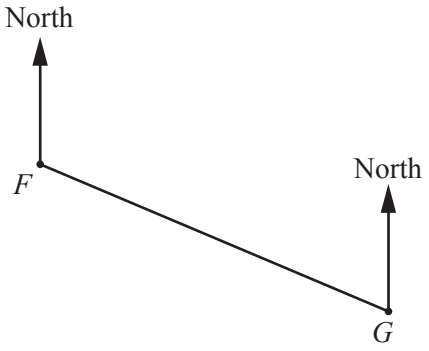
a = ... because .....

b = ... because .....

c = ... because ..... [6]

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(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.

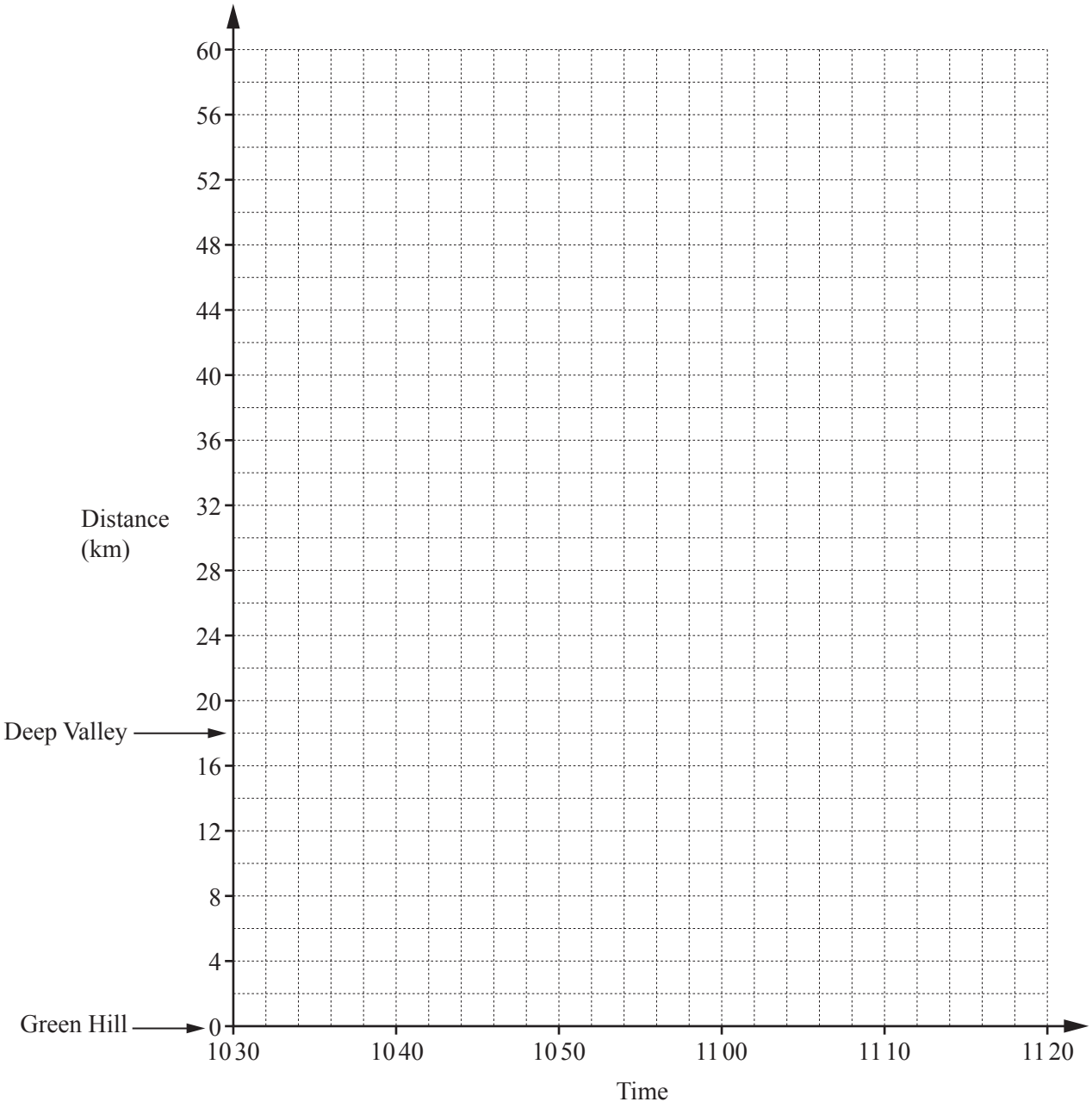
..... km [2]

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

..... km [1]

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(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.

$2w + 5b =$ ..... [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.

$w =$ .....

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

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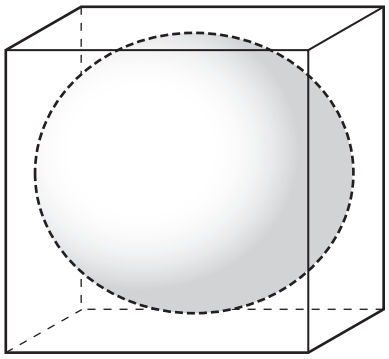
(c) A black marble is weighed and its mass, m grams, is 35 g correct to the nearest 5 g.

Complete the statement about the value of m.

..... $\leqslant m <$ ..... [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.



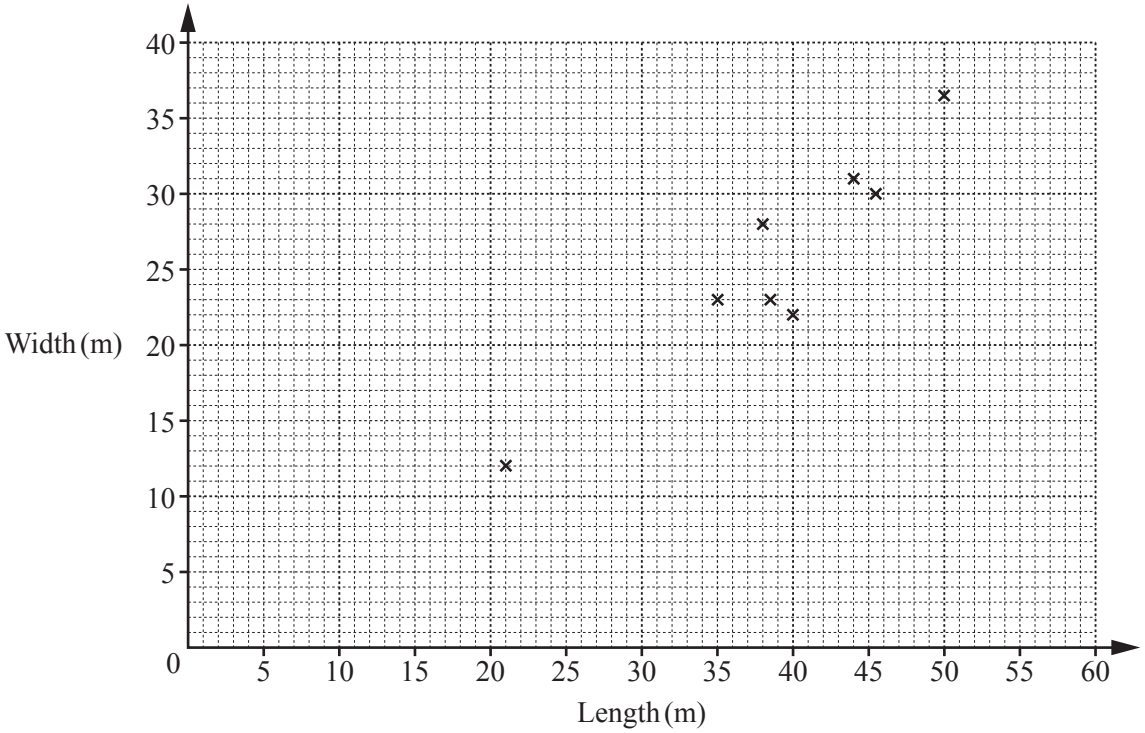
NOT TO SCALE

[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]

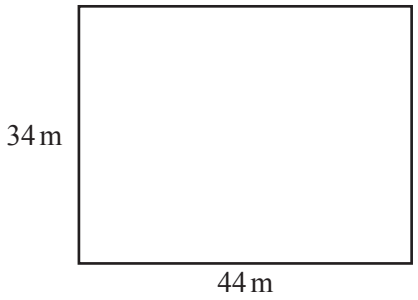
(ii) Another student, Pedro, estimates the length of the hall as 31 m.
His result for the width is missing.

Use your line of best fit to estimate his result for the width.

..... m [1]

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



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(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]

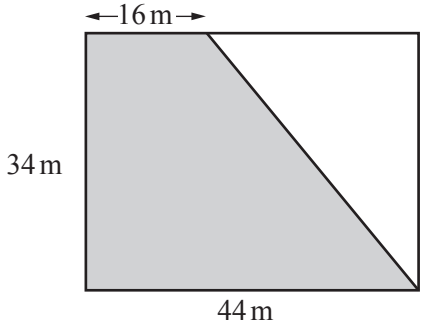
(ii) Work out the perimeter of the hall.

..... m [1]

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

..... m [2]

(e) The hall is divided into two areas.



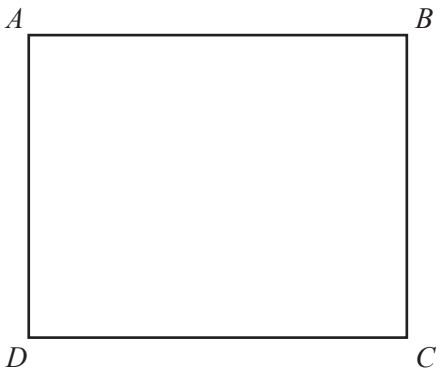
NOT TO SCALE

Find the shaded area.

..... m^2 [2]

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

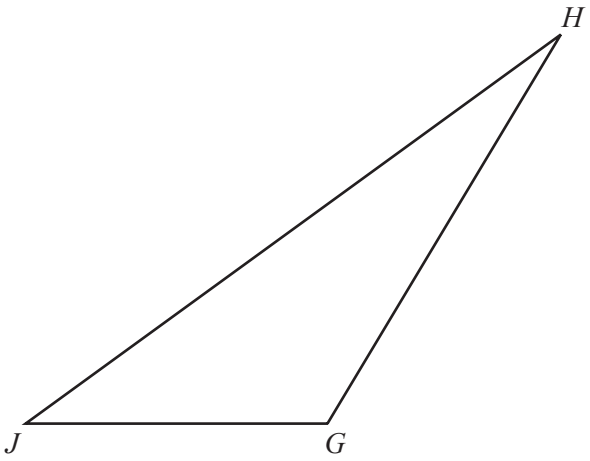
(a) *ABCD* is a rectangle.



(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]

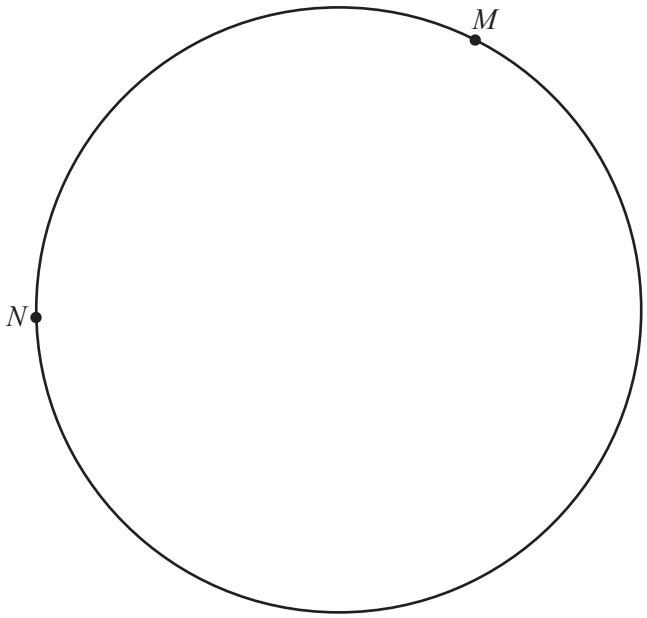
(ii) Shade the region inside the triangle that is closer to *G* than to *H*. [1]

(iii) Measure the reflex angle at *H*.

..... [1]

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(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]

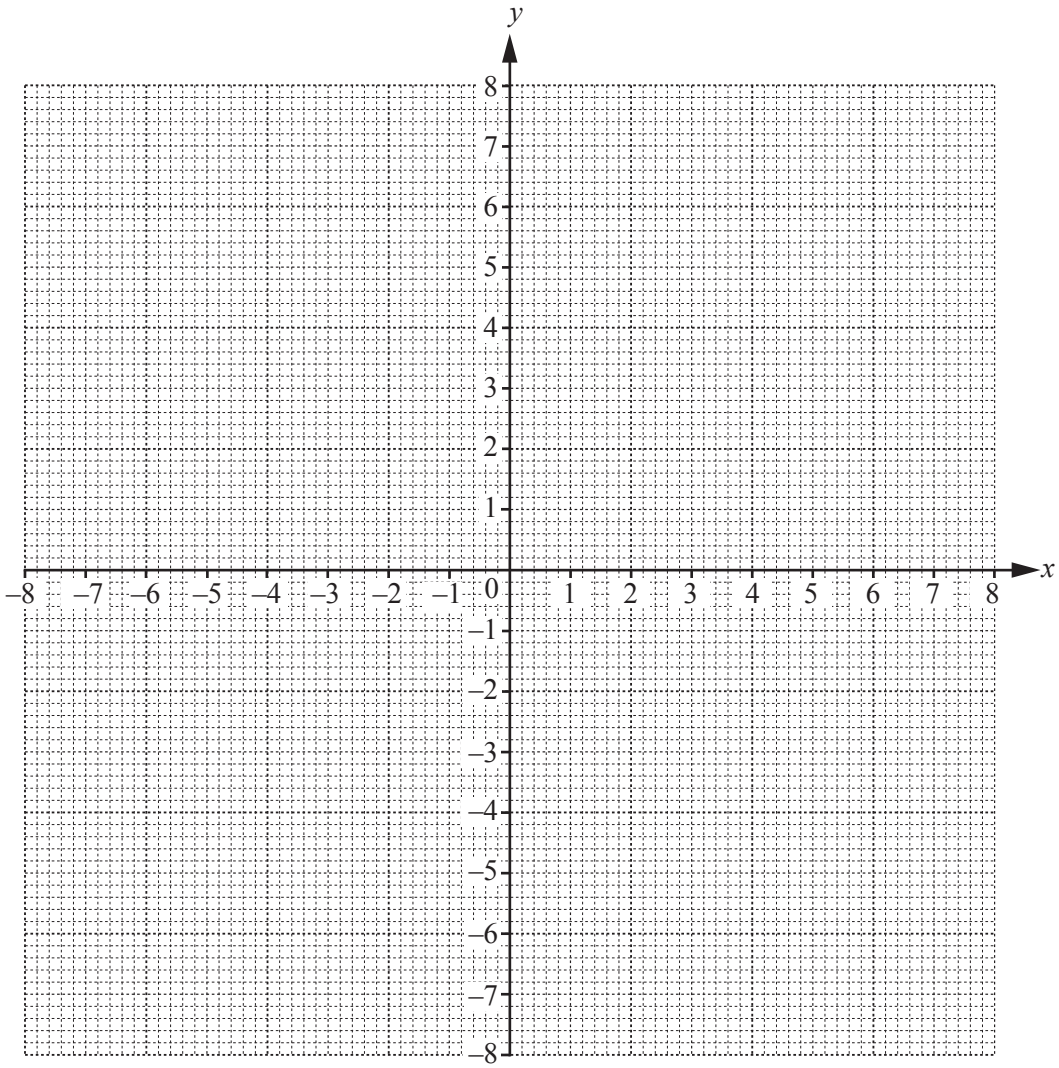
Question 9 is printed on the next page.

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

[2]

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



[4]

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

..... 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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