Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

MATHEMATICS **0580/33**

Paper 3 (Core) **May/June 2018**

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.

1 **(a)** The table shows the temperature at Lexford Station at 10 00 each day for a week.

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Temperature (°C)	−3	4	−1	0	−5	2	1

(i) Write down the day which had the coldest temperature.

..... [1]

(ii) Work out the difference in the temperature between Monday and Tuesday.

..... °C [1]

(iii) The temperature falls 6°C from 10 00 to midnight on Sunday.

Work out the temperature at midnight.

..... °C [1]

(b) The distance between Lexford Station and Crowton Station is 6.5 km.

(i) A train travels between these stations at an average speed of 39 km/h.

Work out how long, in minutes, it takes the train to travel between these stations.

..... min [3]

(ii) Each wheel on the train has a diameter of 1.8 m.

Work out the number of complete turns each wheel makes in travelling the 6.5 km.

..... [4]

(c) A northbound train leaves Lexford Station every 30 minutes.
A bus leaves Lexford Station every 45 minutes.

At 11 40 a northbound train and a bus leave the station together.

Find the next time when this happens.

..... [3]

(d) Here is part of a timetable for trains going east to west from Lexford Station.

Lexford	09 14	09 47	10 21	11 15	11 48
Crowton	09 26	09 59	10 33	11 27	12 00
Doniton Halt	09 42	10 15	10 49	11 43	12 16
Mosshead	10 01	10 34	11 08	12 02	12 35

(i) Work out the number of minutes the 09 14 train takes to travel from Lexford to Mosshead.

..... min [1]

(ii) Freda must arrive at Mosshead by 11 30.

Write down the latest time she can catch a train from Lexford.

..... [1]

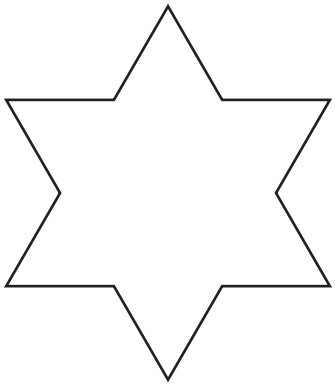
(e) 437 people go on a coach trip.
Each coach seats 62 people.

How many coaches are needed?

..... [2]

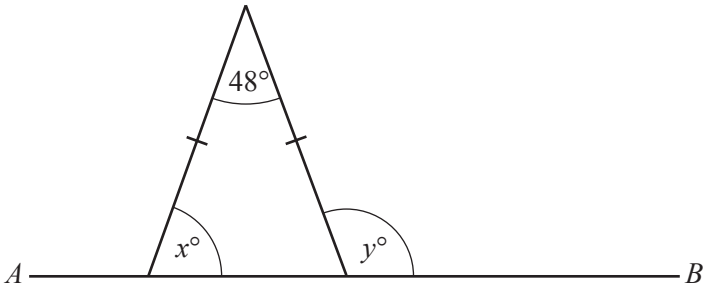
[Turn over

2 **(a)** Draw all the lines of symmetry on each shape.



[4]

(b) The diagram shows an isosceles triangle and a straight line AB.



NOT TO SCALE

Find the value of x and the value of y.

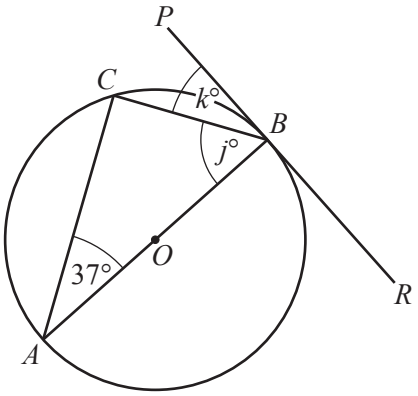
$x =$ .....

$y =$ ..... [2]

(c) Find the size of one interior angle of a regular decagon.

..... [3]

(d)



NOT TO SCALE

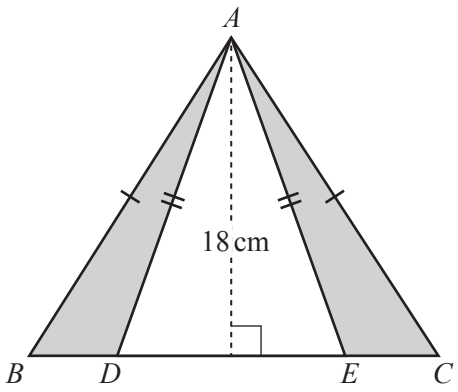
The points A, B and C lie on the circumference of a circle, centre O.
PBR is a tangent to the circle and angle $BAC = 37°$.

Find the value of j and the value of k.

$j =$ .....

$k =$ ..... [3]

(e)



NOT TO SCALE

ABC and ADE are isosceles triangles, each with perpendicular height 18 cm.
$BC = 35$ cm and $DE = 27$ cm.

Find the total area of the two shaded parts of the diagram.

..... cm^2 [3]

3 **(a)** A museum's opening times are shown in this table.

Day	Opening times
Monday to Thursday	09 00 to 17 00
Friday	08 30 to 18 00
Saturday	09 00 to 19 00
Sunday	Closed

Work out how many hours in a week the museum is open for.

..... hours [3]

(b) The table shows the cost of tickets for the museum.

	Cost
Adult	$4.20
Senior (aged over 60)	$2.80
Child (aged 5 to 15)	$1.80
Child (aged under 5)	Free

The Reeve family visit the museum.
Mrs Reeve is aged 36, her father is 67, her mother is 65, and her three children are 2, 7 and 12.

Work out the total cost for these six people to visit the museum.

$..... [3]

(c) Mrs Reeve buys 6 ice creams.
Each ice cream costs $1.30 .

How much change does she receive from $10?

$..... [2]

(d) Last year, the museum had twenty seven thousand and fifty three visitors.

Write this number in figures.

..... [1]

(e) In 2015, there were 12 400 visitors to the museum.
In 2016, there were 14 100 visitors to the museum.

Calculate the percentage increase in the number of visitors from 2015 to 2016.

..... % [3]

(f) The door to the museum has an 8-digit code to unlock it.

- The next odd number after 35 gives digits 1 and 2.
- The next prime number after 23 gives digits 3 and 4.
- The square root of 225 gives digits 5 and 6.
- The value of 2^6 gives digits 7 and 8.

Use this information to complete the door code.
Digits 1 and 2 have been completed for you.

Digit	1	2	3	4	5	6	7	8
Code	3	7						

[3]

4 **(a)** Solve these equations.

(i) $3x = 18$

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

(ii) $8x - 15 = 6x + 2$

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

(b) Factorise.

$5x - 15$

..... [1]

(c) Simplify.

$2x - 6y + 3x + 2y$

..... [2]

(d) Find the value of $5u - 2v$ when $u = 11$ and $v = -3$.

..... [2]

(e) Make p the subject of this formula.

$$H = 7p - 3$$

$p =$ ..... [2]

(f) **(i)** Find the value of k when $x^{10} \div x^k = x^3$.

$k =$ ..... [1]

(ii) Find the value of n when $y^{10} \times y^n = 1$.

$n =$ ..... [1]

5 **(a)** Geoff keeps a record of the number of goals scored in the first eight games played by his football team.

3 1 8 5 7 2 1 6

Find

(i) the mode,

..... [1]

(ii) the range,

..... [1]

(iii) the median.

..... [2]

(b) The table shows the number of goals scored by Geoff's team in each game during one season.

Number of goals	0	1	2	3	4	5	6	7	8
Number of games	5	7	8	10	6	4	5	3	2

(i) How many games did the team play?

..... [1]

(ii) Work out the mean number of goals scored per game.

..... [3]

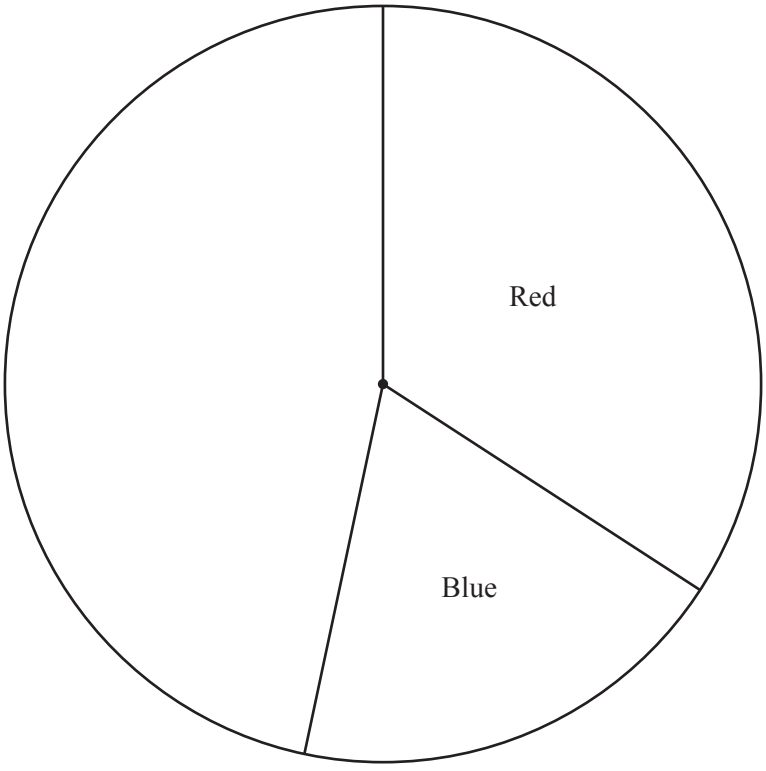
(c) Geoff asks some supporters to choose a new colour for the team's shirts.
The results are to be shown in a pie chart.
The table shows some of this information.

Colour	Frequency	Pie chart sector angle
Red	41	123°
Blue		69°
Green		
Other	18	54°

(i) Complete the table.

[3]

(ii) Complete the pie chart.



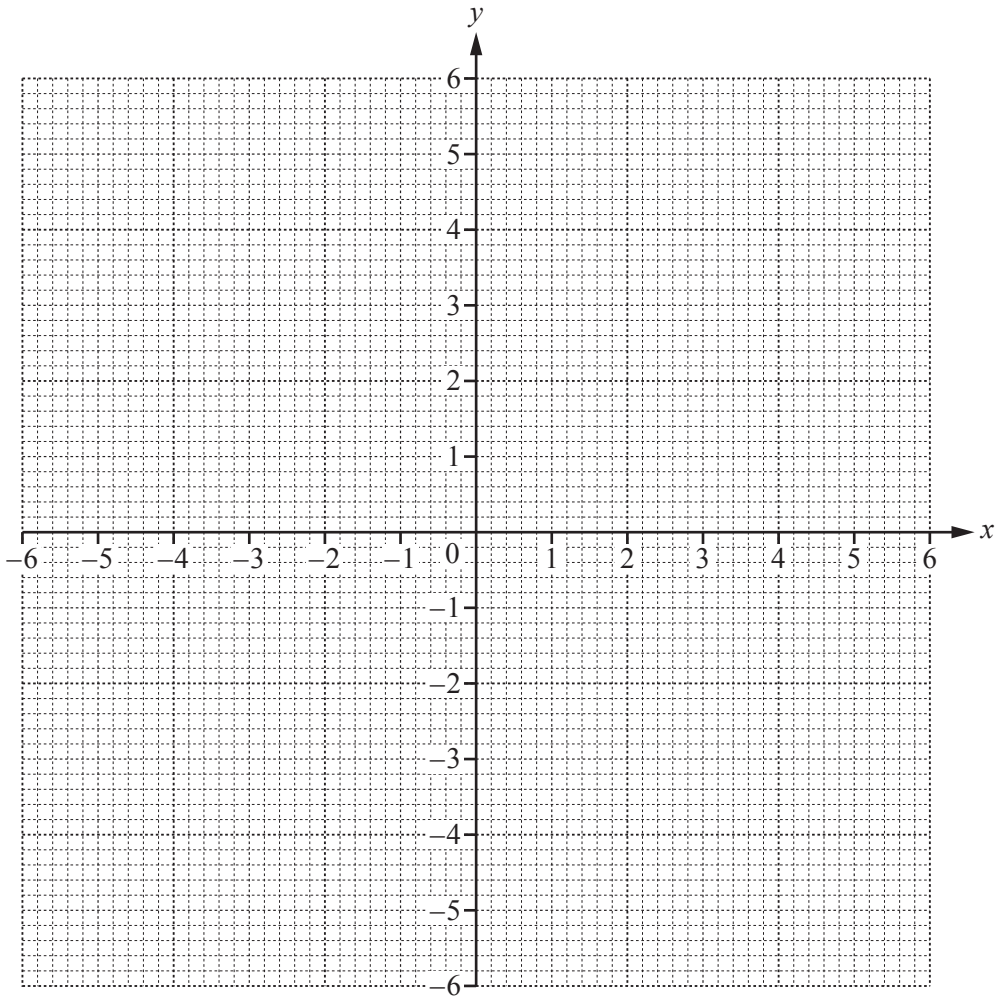
[1]

6 **(a)** Complete the table of values for $y = \frac{6}{x}$, $x \neq 0$.

x	-6	-4	-3	-2	-1		1	2	3	4	6
y		-1.5		-3				3		1.5	

[3]

(b) On the grid, draw the graph of $y = \frac{6}{x}$ for $-6 \leqslant x \leqslant -1$ and $1 \leqslant x \leqslant 6$.



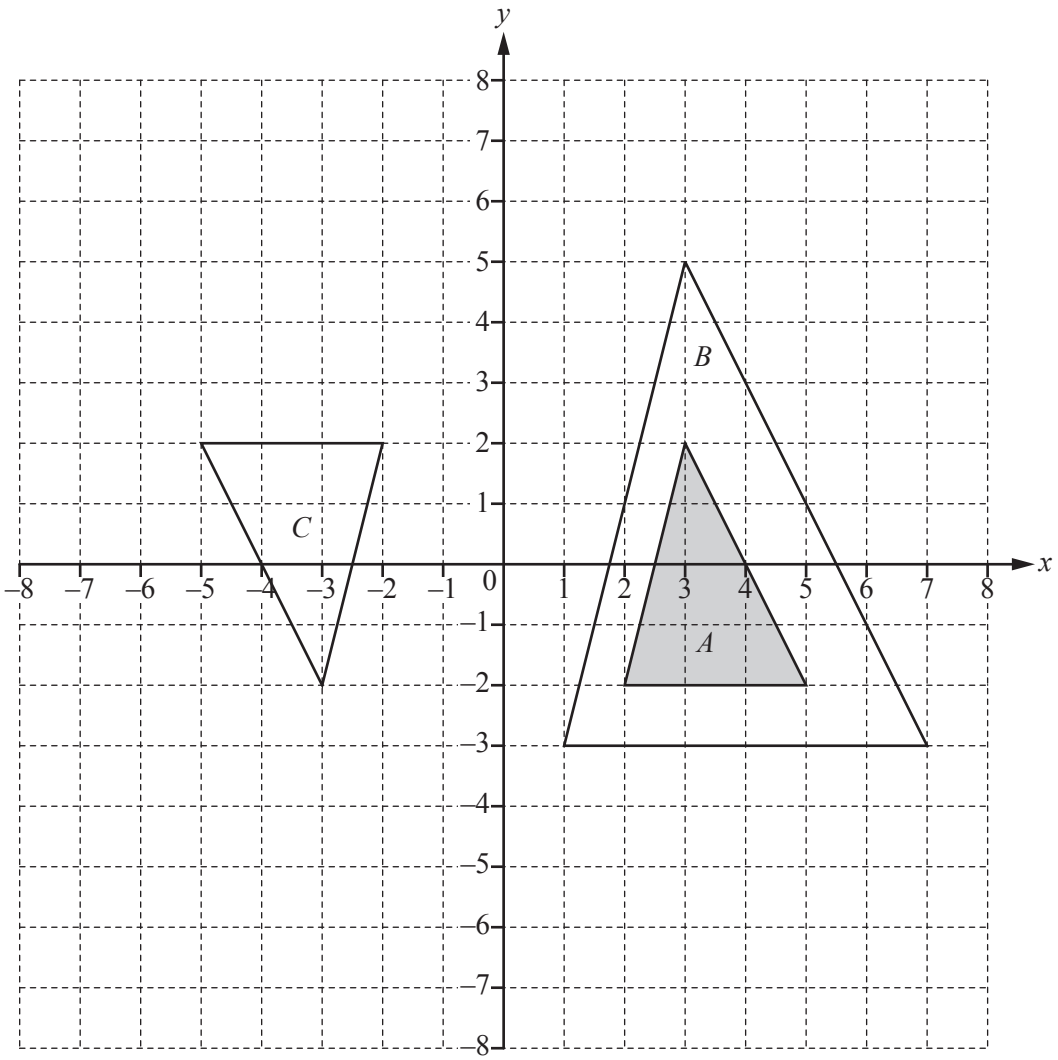
[4]

(c) On the grid, draw the line $y = -5$. [1]

(d) Use your graph to solve the equation $\frac{6}{x} = -5$.

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

7 The diagram shows three triangles A, B and C.



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

.....

..... [3]

(b) Describe fully the **single** transformation that maps triangle A onto triangle C.

.....

..... [3]

(c) Draw the image of

(i) triangle A after a translation by the vector $\begin{pmatrix} -6 \\ 5 \end{pmatrix}$, [2]

(ii) triangle A after a reflection in the line $y = -3$. [2]

8 **(a)** A bag contains 6 green balls, 5 red balls and 3 blue balls only.
A ball is taken from the bag at random.

Find the probability that the ball is

(i) green,

..... [1]

(ii) green or red,

..... [1]

(iii) yellow.

..... [1]

(b) Another bag contains brown balls, white balls, black balls and purple balls only.
A ball is taken from this bag at random.

Colour	Brown	White	Black	Purple
Probability	0.46	0.22	0.14	

(i) Complete the table.

[2]

(ii) Which colour is the most likely to be taken?

..... [1]

(iii) There are 50 balls in this bag.

Work out the number of black balls.

..... [1]

9 **(a)** These are the first four terms of a sequence.

8 15 22 29

(i) Find the next term of this sequence.

..... [1]

(ii) Describe the rule for continuing this sequence.

..... [1]

(iii) Find an expression for the nth term of this sequence.

..... [2]

(b) Find the first three terms of another sequence whose nth term is $n^2 + 10$.

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

(c) Write down an expression for the nth term of this sequence.

1 8 27 64

..... [1]

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