Cambridge IGCSE

Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

3353387033

MATHEMATICS **0580/32**

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

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.

© UCLES 2019

Cambridge Assessment International Education

[Turn over

1 **(a)** **(i)** Write 26% as a decimal.

..... [1]

(ii) Write 0.48 as a fraction.

..... [1]

(b) Write down

(i) a fraction that is equivalent to $\frac{5}{9}$,

..... [1]

(ii) the 7th odd positive number,

..... [1]

(iii) a decimal number that is larger than 0.0467 but smaller than 0.0468 .

..... [1]

(c) Find the value of

(i) $\sqrt[3]{512}$,

..... [1]

(ii) $\frac{6^8}{2^6}$,

..... [1]

(iii) 7^0.

..... [1]

(d) Find the first even multiple of seven that is greater than 100.

..... [2]

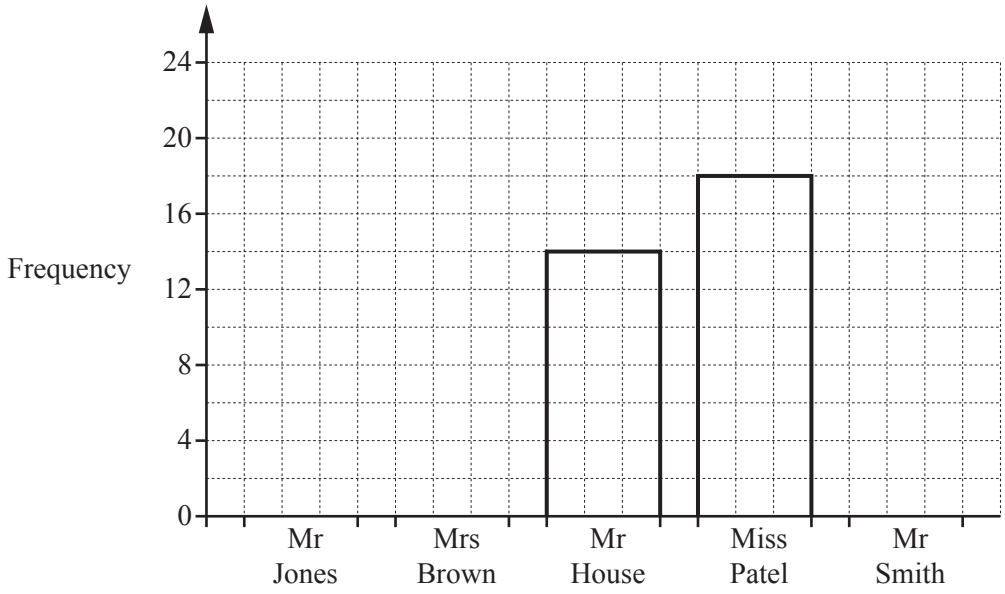
(e) 6^{-1} $\sqrt{10}$ 8.97×10^{-3} $\frac{7}{5}$ $\sqrt{64}$

From the list, write down the irrational number.

..... [1]

© UCLES 2019

2 80 students each record the name of their mathematics teacher.
The number of these students taught by Mr House and by Miss Patel are shown in the bar chart.



(a) How many more students are taught by Miss Patel than by Mr House?

..... [1]

(b) 15 students are taught by Mr Smith.
Twice as many students are taught by Mrs Brown than by Mr Jones.

Use this information to complete the bar chart.

[4]

(c) Write down the mode.

..... [1]

(d) One of these students is chosen at random.

Work out the probability that this student

(i) is taught by Mr House,

..... [1]

(ii) is not taught by either Mr House or Miss Patel.

..... [2]

(e) This information is also to be shown in a pie chart.

Work out the sector angle for Miss Patel.

..... [2]

3 Mr Lester has a fruit and vegetable shop.

(a) Apples cost 32 cents each.
Suki buys 6 apples.

Work out the change Mr Lester gives Suki when she pays with a $10 note.

$ ..... [2]

(b) Green grapes cost $3.10 per kilogram.
Red grapes cost $2.80 per kilogram.

Work out the total cost of buying 0.6 kg of green grapes and $\frac{3}{4}$ kg of red grapes.

$ ..... [3]

(c) George spends $12 on fruit each week.
The total amount he spends on food is $75.

Work out the percentage of the $75 he spends on fruit.

.....% [1]

(d) Mr Lester buys pineapples for $1.50 each.
He makes 60% profit when he sells them.

Work out the selling price of a pineapple.

$ ..... [2]

© UCLES 2019

(e) The table shows the number of bananas bought by the last 50 customers.

Number of bananas bought	Frequency
0	14
1	0
2	2
3	5
4	11
5	8
6	10

(i) Find the range.

..... [1]

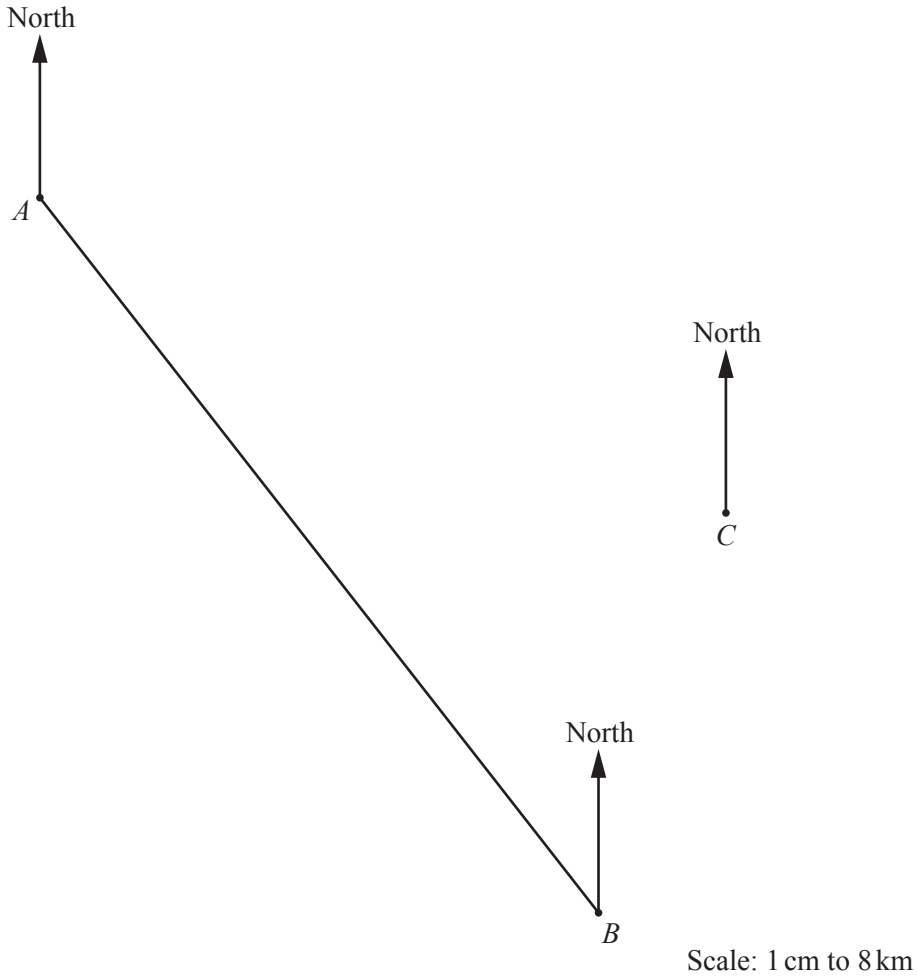
(ii) Work out the median.

..... [1]

(iii) Calculate the mean.

..... [3]

4 The scale drawing shows town *A*, town *B* and town *C* on a map.
There is a straight road between town *A* and town *B*.
The scale of the map is 1 centimetre represents 8 kilometres.



(a) Measure the bearing of town *A* from town *B*.

..... [1]

(b) Work out the actual distance, in kilometres, between town *A* and town *B*.

..... km [2]

(c) Write the scale of the map in the form 1 : n.

1 : ..... [1]

(d) A straight road from town C is on a bearing of 246°.
It meets the road from town A to town B at point X.

On the map, draw the road from town C to point X.
Label the position of X.

[1]

(e) **(i)** Josie is at point X at 10 50.
She arrives at town B 37 minutes later.

Work out the time that she arrives at town B.

..... [1]

(ii) Sammy leaves town A and travels to town B at a constant speed of 75 km/h.

(a) Work out the time for this journey.
Give your answer in hours and minutes, correct to the nearest minute.

..... h ..... min [3]

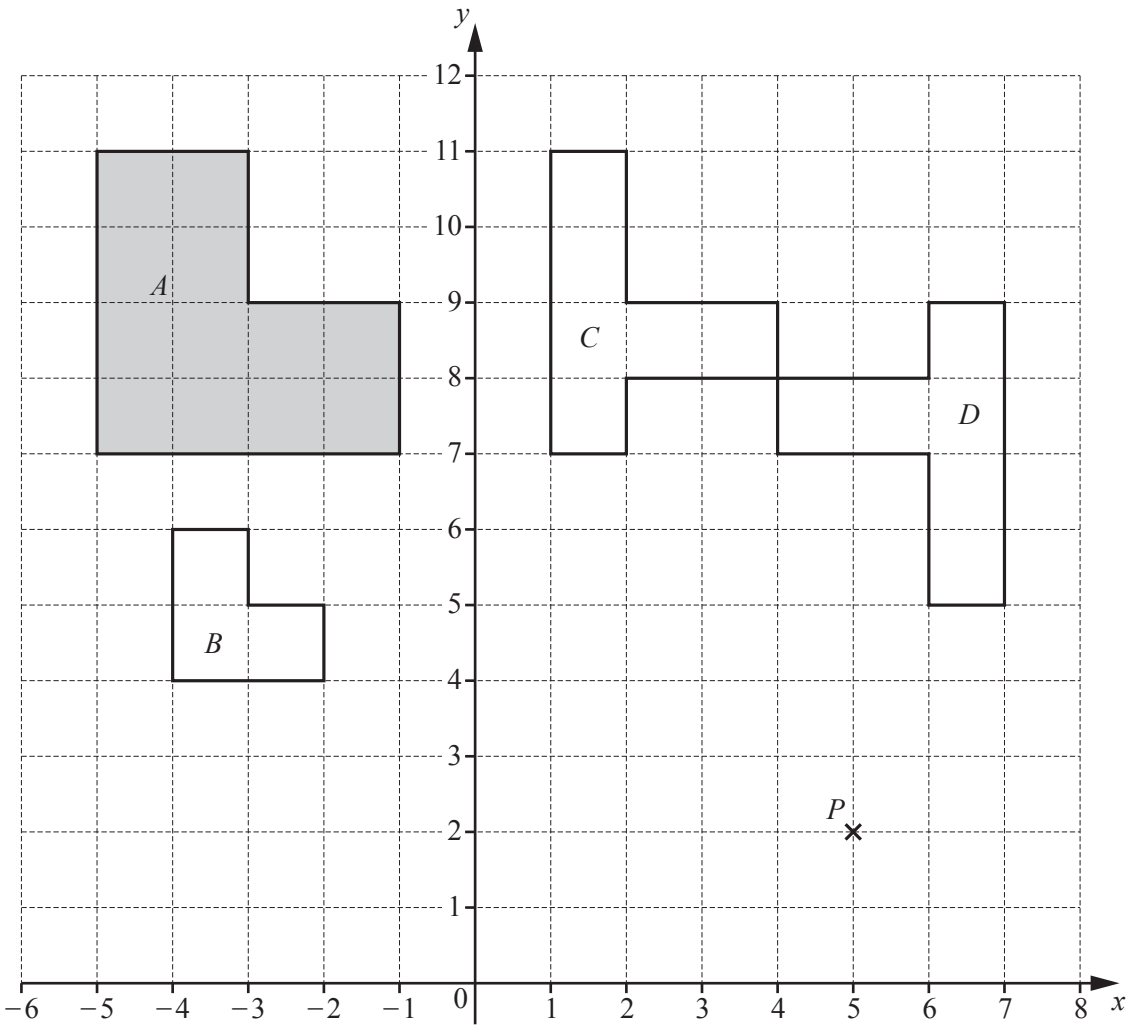
(b) Sammy wants to arrive at town B at the same time as Josie.

Work out the time that Sammy must leave town A.

..... [1]

© UCLES 2019

5 The diagram shows four shapes A, B, C and D and a point P on a 1 cm^2 grid.



(a) Find

(i) the perimeter of shape A,

..... cm [1]

(ii) the area of shape A.

.....cm^2 [1]

© UCLES 2019

(b) (i) Write down the co-ordinates of point P.

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

(ii) Find the co-ordinates of the image of point P when

(a) P is reflected in the y-axis,

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

(b) P is reflected in the line $y = 6$.

(..... , ...) [2]

(iii) Find the vector that translates point P to the point $(49, -12)$.

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [2]

(c) Describe fully the **single** transformation that maps

(i) shape A onto shape B,

.....

..... [3]

(ii) shape C onto shape D.

.....

..... [3]

© UCLES 2019

6 **(a)** The grid shows the first three diagrams in a sequence.

Each diagram is made using identical small squares.
Each square has sides that are 1 unit long.

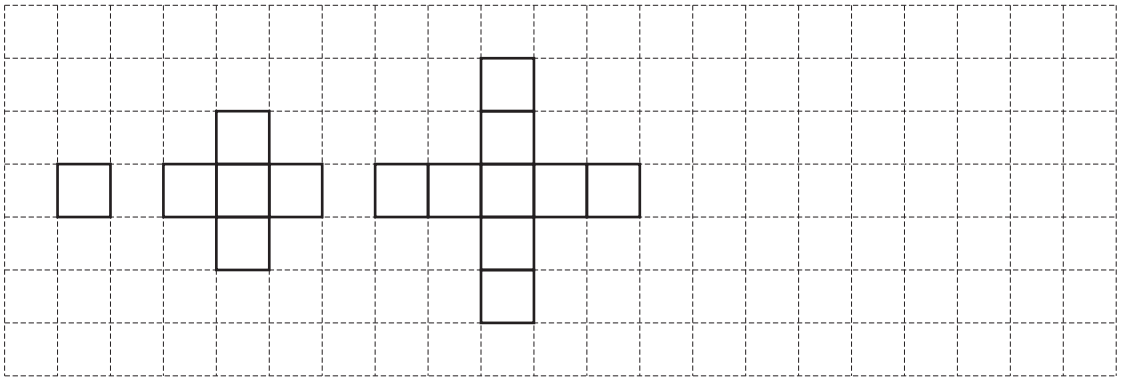


Diagram 1 Diagram 2 Diagram 3 Diagram 4

(i) On the grid, draw Diagram 4. [1]

(ii) Complete the table.

Diagram number	1	2	3	4
Perimeter	4	12	20	

[1]

(iii) Find an expression, in terms of n, for the perimeter of Diagram n.

..... [2]

(iv) For one of the diagrams in the sequence the perimeter is 300 units.

Work out its Diagram number.

..... [2]

(v) **Diagram 3** is drawn on a piece of card.
The side of each small square is 7 cm.
The diagram is the net of an open box.

Calculate the volume of this box.
Give the units of your answer.

.... [3]

© UCLES 2019

(b) These are the first four diagrams in a sequence.
Each diagram is made from small equilateral triangles.

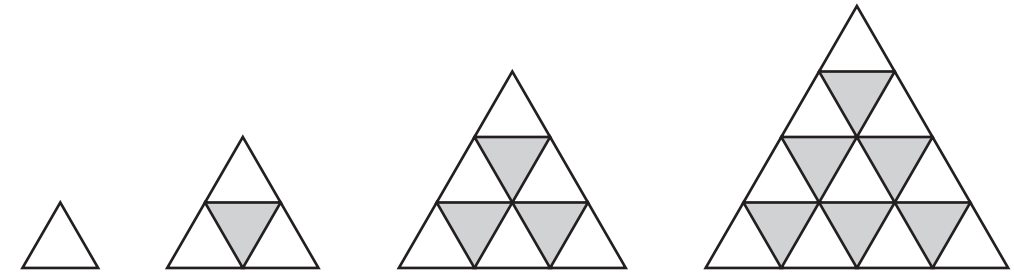


Diagram 1 Diagram 2 Diagram 3 Diagram 4

(i) Write down the number of lines of symmetry of Diagram 3.

..... [1]

(ii) Complete the table.

Diagram number (n)	1	2	3	4
Number of white triangles (w)	1	3	6	
Number of grey triangles (g)	0		3	
Total number of small triangles (t)	1	4		

[2]

(iii) Find a formula, in terms of n, for the total number of small triangles, t, in Diagram n.

$t =$ ..... [1]

(iv) The formula for the number of white triangles, w, in Diagram n is $w = \frac{1}{2}n(n+1)$.

Show that this formula gives the correct number of white triangles when $n = 3$.

[2]

(v) Complete this statement for Diagram 15.

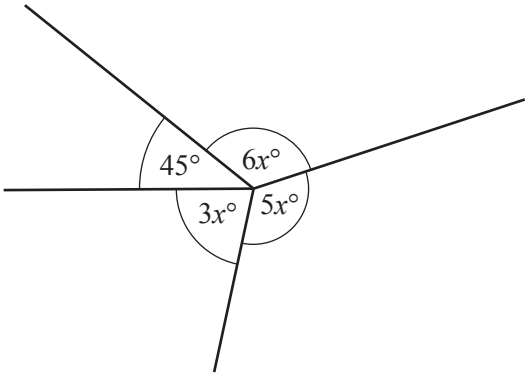
When $n = 15$, $w =$ ..... , $g =$ ..... and $t =$ ..... [3]

7 **(a)** A triangle is isosceles.
One of its angles is 96°.

Find the other two angles.

..... and ..... [1]

(b)



NOT TO SCALE

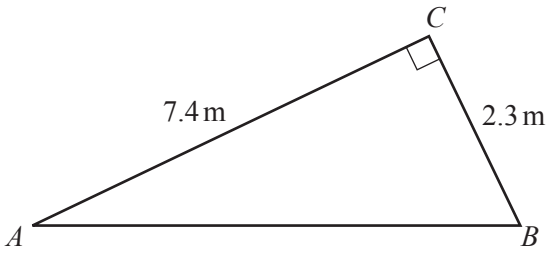
Find the value of x.

$x =$ ..... [4]

(c) Work out the size of one interior angle of a regular polygon with 20 sides.

..... [3]

(d)



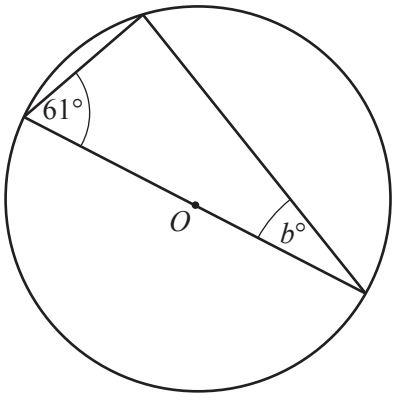
NOT TO SCALE

The diagram shows a right-angled triangle ABC.

Calculate the length of AB.

$AB =$ ..... m [2]

(e) The diagram shows the vertices of a triangle lying on the circumference of a circle with centre O.



NOT TO SCALE

Find the value of b.
Give a reason for your answer.

$b =$ ..... because ..... [2]

8 **(a)** **(i)** Write down the co-ordinates of the point where the line $y = 6x - 3$ crosses the y-axis.

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

(ii) Write down the equation of the straight line that

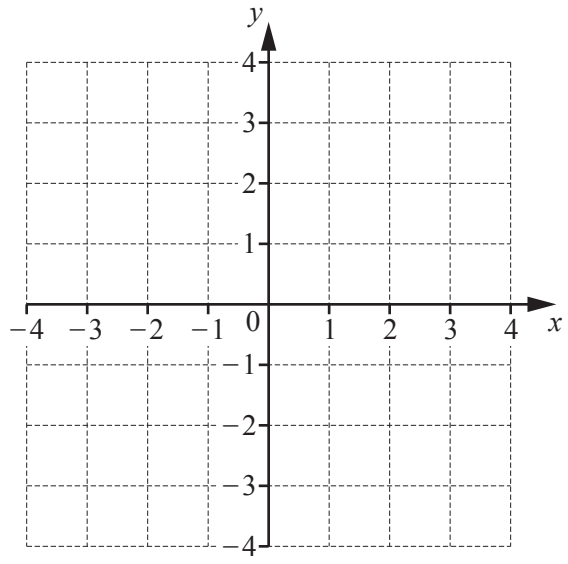
- passes through the origin

and

- is parallel to $y = 6x - 3$.

..... [1]

(b)



(i) On the grid, draw the line through the point $(-3, -2)$ that is perpendicular to the y-axis.

[1]

(ii) On the grid, draw the line $y = -2x$.

[1]

(c) The equations of two straight lines are $y = 3x + 13$ and $y = 7x - 3$.

Use algebra to solve these two simultaneous equations to find the co-ordinates of the point where the lines meet.
You must show all your working.

(..... , ...) [3]

Question 9 is printed on the next page.

9 Zach goes on holiday.

(a) The mass, m kilograms, of his suitcase is 23.5 kg, correct to the nearest 500 g.

Complete this statement about the value of m.

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

(b) The ratio of the costs flights : hotels = 3 : 8.
The cost of the flights is $861.

Work out the total cost of flights and hotels.

$ ..... [2]

(c)

$1 = 0.88 euros
£1 = 1.15 euros

Zach changes $575 into euros.
He spends 45% of the euros in France.
He changes the euros he does not use into pounds (£) to spend in England.

Work out how many pounds he receives.

£ ..... [4]

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which itself is a department of the University of Cambridge.

© UCLES 2019