Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

MATHEMATICS **0580/32**

Paper 3 (Core) **October/November 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.

1 **(a)** Pablo leaves home at 07 35 and arrives at school at 08 20.

(i) Find how many minutes it takes Pablo to get to school.

.....min [1]

(ii) The first lesson starts at 08 55 and ends 1 hour 15 minutes later.

Find the time the first lesson ends.

..... [1]

(iii) In one school week of 5 days, Pablo goes to and from school on the bus each day.
He buys a 5-day ticket that costs $7.75 .
A 1-day ticket costs $1.66 .

Calculate how much Pablo saves by buying a 5-day ticket.

$..... [2]

(b) Pablo records the time, correct to the nearest minute, each student in his class spent on their homework.

30	42	56	12	15	10	50	8	58	24	34	41	11	36	18
9	21	48	35	42	27	44	52	15	56	19	22	54	41	30

(i) Find the range.

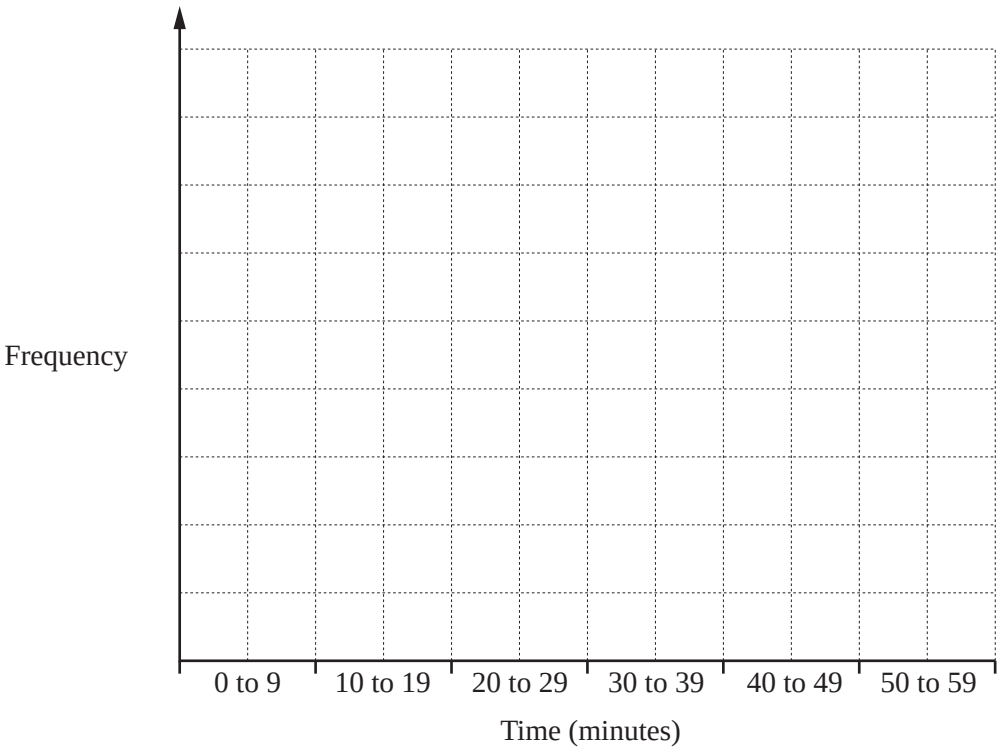
.....min [1]

(ii) Complete the frequency table.
You may use the tally column to help you.

Time (minutes)	Tally	Frequency
0 to 9		
10 to 19		
20 to 29		
30 to 39		
40 to 49		
50 to 59		
	Total	30

[2]

(iii) Draw a bar chart to show this information.
Complete the scale on the frequency axis.



[3]

(iv) Write down the modal class interval.

..... to ..... [1]

2 **(a)** Write the number 8045 in words.

..... [1]

(b) Write down a number between 60 and 70 that is

(i) a square number,

..... [1]

(ii) a prime number,

..... [1]

(iii) a common multiple of 4 and 17.

..... [1]

(c) **(i)** Write 98 as a product of its prime factors.

..... [2]

(ii) Find the highest common factor (HCF) of 98 and 182.

..... [2]

(d) Find the value of

(i) 6^4,

..... [1]

(ii) $\sqrt[3]{24\,389}$,

..... [1]

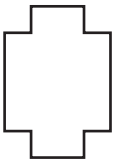
(iii) 14^1,

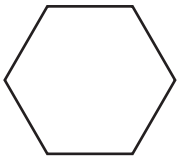
..... [1]

(iv) 5^{-3}.

..... [1]

3 **(a)** Write down the order of rotational symmetry of each shape.

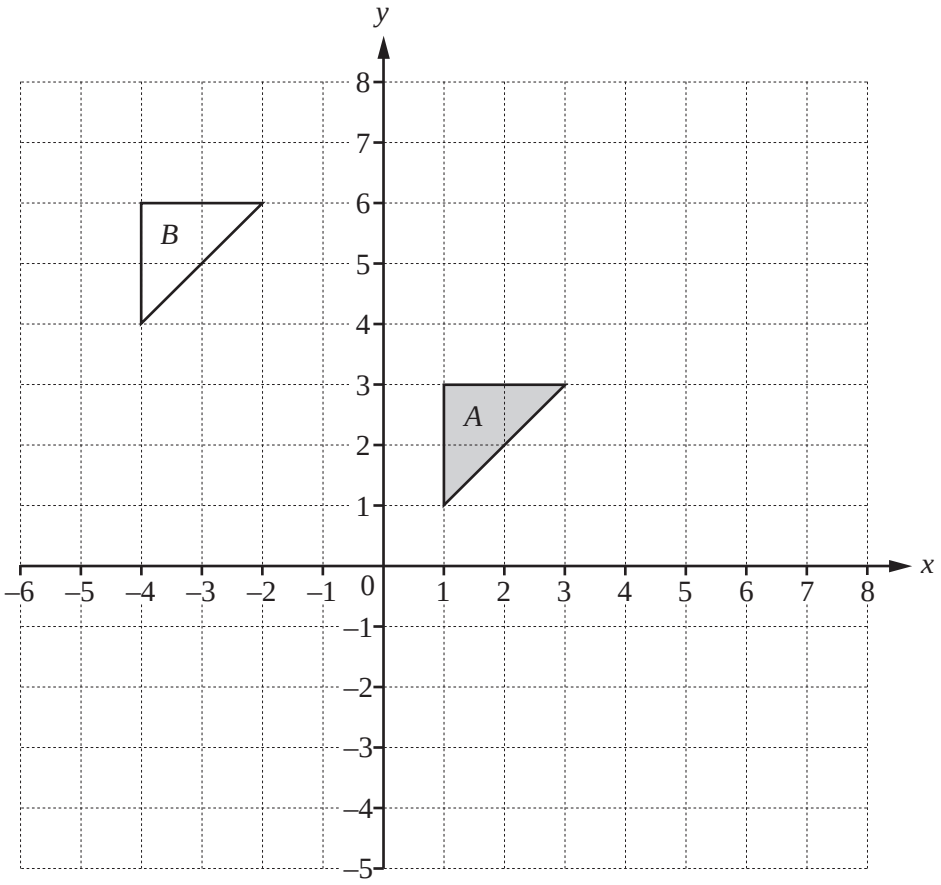




....

[2]

(b)



(i) On the grid, reflect triangle A in the line $x = -1$. [2]

(ii) On the grid, enlarge triangle A by scale factor 2, centre (0, 0). [2]

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

.....

..... [2]

4 Leo, Kim and Priya own a shop.

(a) **(i)** Pens cost \$1.45 each.
Andre has a \$10 note.

Find the greatest number of pens that he can buy and how much change he receives.

Number of pens = ...

Change = \$..... [3]

(ii) The price of a pack of printer paper is \$5.60 .
In a sale this price is reduced by 15%.

Calculate the sale price.

\$..... [2]

(b) Each day, Kim records the number of people who buy a pen.
The results for 10 days are shown below.

40 7 19 25 18 19 32 57 12 47

Find the median.

..... [2]

(c) The shop makes a profit of \$7000.
The profit is shared in the ratio Leo : Kim : Priya = 6 : 3 : 5.

Calculate the amount they each receive.

Leo = \$.....

Kim = \$.....

Priya = \$..... [3]

(d) Leo changed $1400 into pounds (£).
The exchange rate was £1 = $1.54 .

Work out how many pounds Leo received.

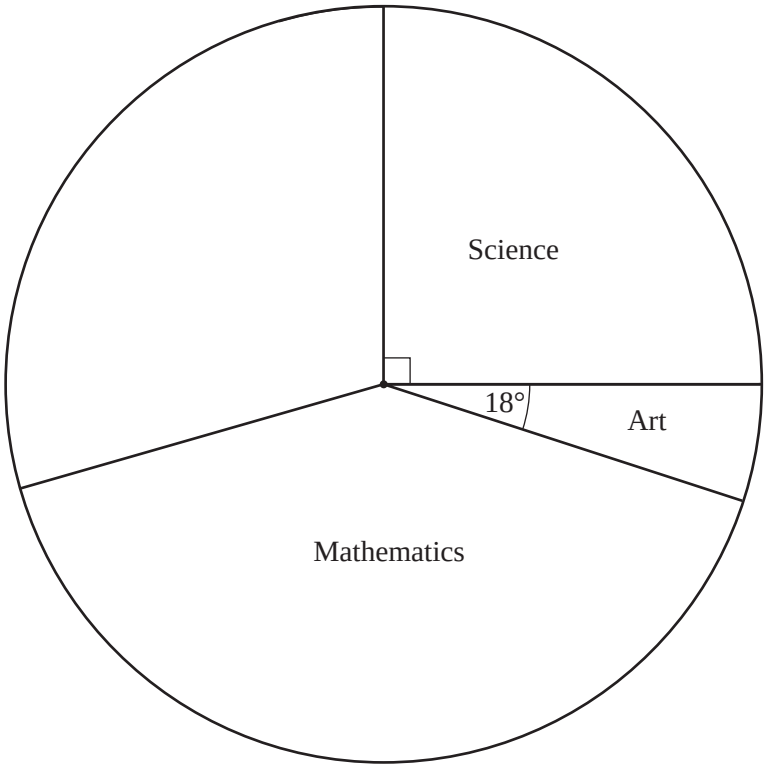
£..... [2]

(e) Priya invested $2000 for 3 years at a rate of 2.6% per year compound interest.

Calculate the value of her investment at the end of the 3 years.

$..... [3]

5 Nico asked each of 900 students at her school what their favourite subject is.
The students only chose Science, Art, Mathematics, History or Geography.
The pie chart shows some of this information.



(a) Show that 225 students chose Science.

[1]

(b) Find how many students chose Art.

..... [2]

(c) 125 students chose History and 140 chose Geography.

Complete the pie chart to show this information.

[2]

(d) One of the 900 students is selected at random.

(i) Write down the probability that their favourite subject is French.

..... [1]

(ii) Find the probability that their favourite subject is Art.
Give your answer as a fraction in its lowest terms.

..... [2]

(e) The total number of students in the school is 2520.

Estimate how many students you would expect to choose History as their favourite subject.

..... [2]

6 The diagram shows the positions of two towns, *A* and *B*.
The scale is 1 centimetre represents 10 kilometres.

• *B*

Scale: 1 cm to 10 km

(a) (i) Find the actual distance from *A* to *B*.

..... km [2]

(ii) Measure the bearing of *B* from *A*.

..... [1]

(b) (i) Another town, *C*, is 78 km from *A* on a bearing of 103°.

Mark and label the position of town *C* on the diagram. [2]

(ii) Chailai takes 45 minutes to drive the 78 km from town *A* to town *C*.

Calculate her average speed in kilometres per hour.

..... km/h [2]

(c) In this part, use a ruler and compasses only and show your construction arcs.

Mr Lei is moving house.
He wants to live

- nearer to town *B* than town *A*

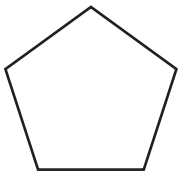
and

- less than 70 km from town *A*.

Construct and shade the region on the diagram in which he wants to live. [5]

7 **(a)** Write down the mathematical name for this polygon.

(i)

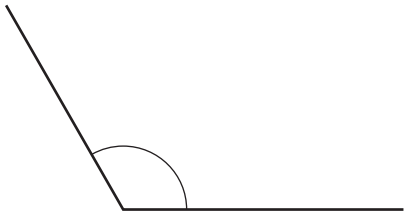


..... [1]

(ii) Write down the mathematical name for this quadrilateral.

..... [1]

(iii) Write down the type of angle shown in this diagram.



..... [1]

(b) A cuboid measures 25 cm by 12 cm by 8 cm.

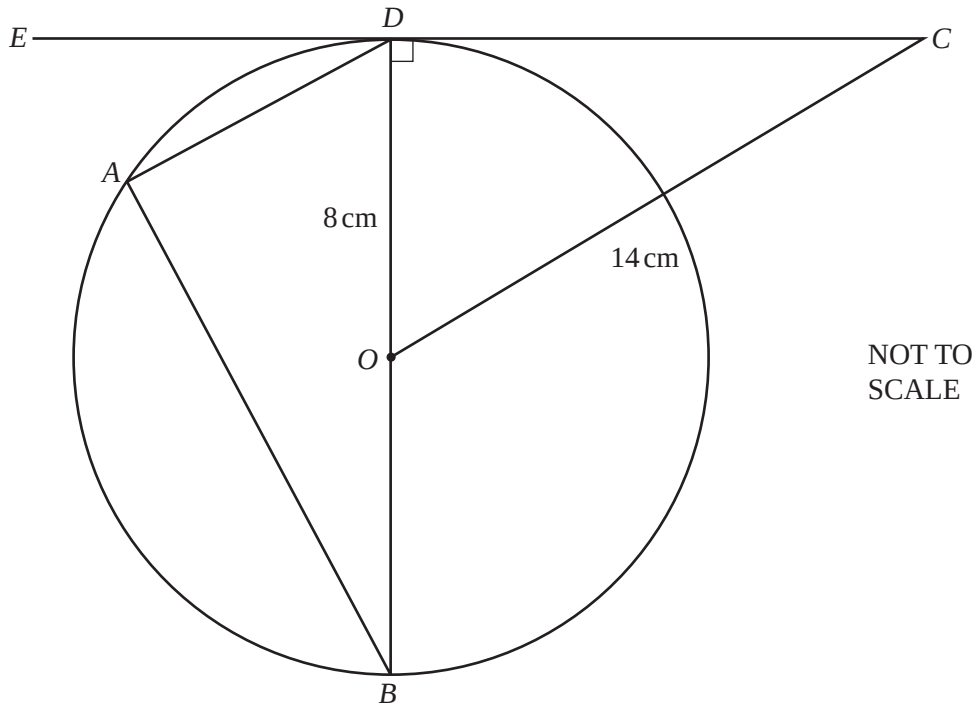
(i) Calculate the volume.

..... cm^3 [2]

(ii) Write this volume in cubic metres.

.....m^3 [1]

(c)



NOT TO SCALE

A, *B* and *D* lie on the circle, centre *O*.
EC is a tangent to the circle at *D*.
OD = 8 cm and *OC* = 14 cm.

(i) Write down the mathematical name for the line *OD*.

..... [1]

(ii) Explain why angle *BAD* is 90°.

..... [1]

(iii) Calculate the circumference of the circle.

..... cm [2]

(iv) Calculate *CD*.

CD = ... cm [3]

8 **(a)** Simplify.

(i) $8p + 2r + 4p - 9r$

..... [2]

(ii) $4x^3 \times 6x^2$

..... [1]

(b) Write down an expression, in terms of x and y, for the total cost of x cakes at 90 cents each and y drinks at 75 cents each.

..... cents [2]

(c) Factorise completely.

$12p^2 - 8p$

..... [2]

(d) Solve.

$4(7r - 3) = 128$

$r =$ ..... [3]

(e) Solve the simultaneous equations.
You must show all your working.

$4x + 3y = 43$
$6x + 7y = 92$

$x =$ .....

$y =$ ..... [4]

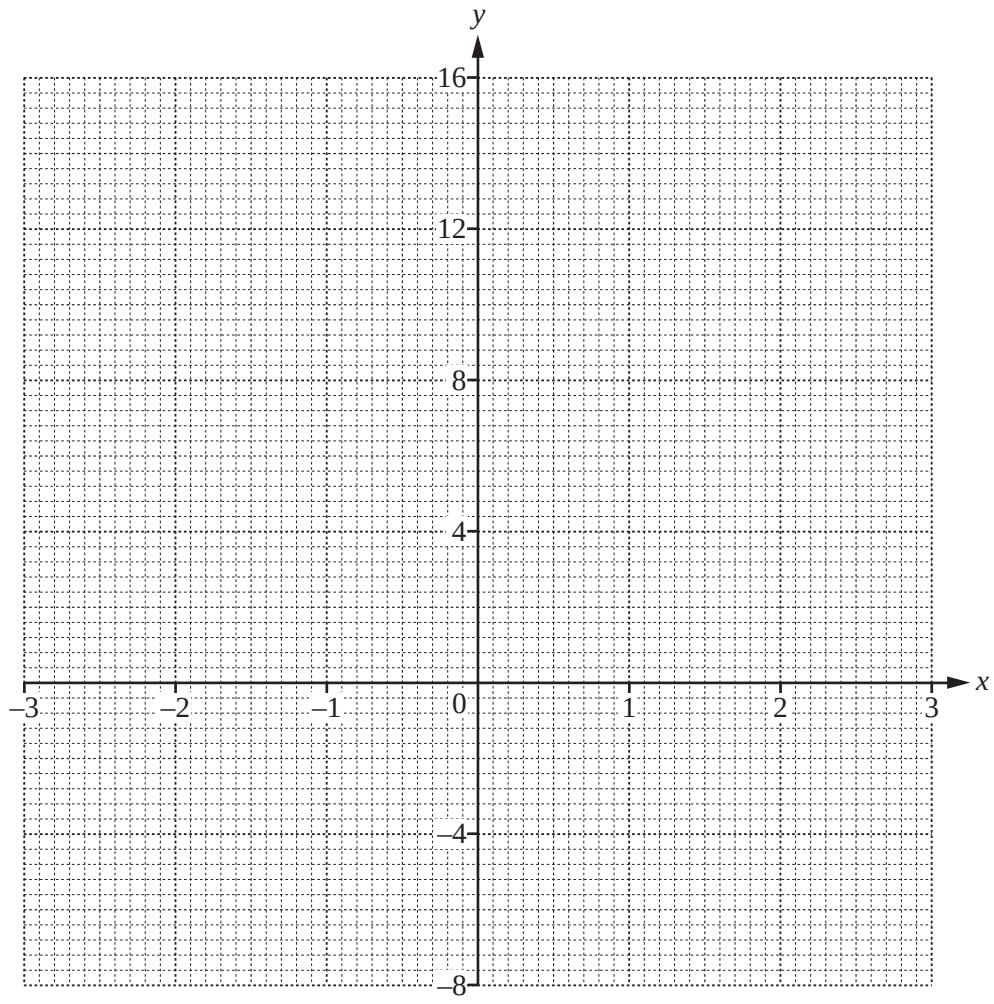
Question 9 is printed on the next page.

9 **(a)** **(i)** Complete the table of values for $y = x^2 + 3x - 4$.

x	−3	−2	−1	0	1	2	3
y	−4	−6		−4	0		

[3]

(ii) On the grid, draw the graph of $y = x^2 + 3x - 4$ for $-3 \leqslant x \leqslant 3$.



[4]

(b) **(i)** On the same grid, draw the line $y = 5$. [1]

(ii) Write down the co-ordinates of the point of intersection of the line $y = 5$ and the graph of $y = x^2 + 3x - 4$ for $-3 \leqslant x \leqslant 3$.

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