

CANDIDATE  
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**MATHEMATICS**

**0626/05**

Paper 5 (Core)

**For Examination from 2017**

SPECIMEN PAPER

**2 hours**



Candidates answer on the Question Paper.

Additional Materials:      Geometrical instruments  
                                  Tracing paper (optional)

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name in the spaces at the top of this page.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams and graphs.

Do not use staples, paper clips, glue or correction fluid.

**DO NOT WRITE IN ANY BARCODES.**

Answer **all** questions.

**Electronic calculators should be used.**

If working is required for any question it must be shown below that question.

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  $\pi$ , 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 96.

This syllabus is regulated in England as a Cambridge International Level 1/Level 2 (9–1) Certificate.

This document consists of **15** printed pages and **1** blank page.

- 1 (a) Here is a list of numbers.

2    4    5    8    9    12

Write down **all** the numbers from this list which are

(i) odd,

..... [1]

(ii) square,

..... [1]

(iii) prime.

..... [1]

- (b) Write one of the symbols  $>$ ,  $<$  or  $=$  to make each statement true.

$$\pi \text{ ..... } \frac{22}{7}$$

$$(\sqrt{2})^2 \text{ ..... } 2$$

$$\frac{1}{1+1} \text{ ..... } 2$$

$$(-1)^2 \text{ ..... } -1$$

[2]

- (c) Put one pair of brackets in each statement to make it true.

(i)  $16 + 8 \div 4 - 2 = 4$

[1]

(ii)  $16 + 8 \div 4 - 2 = 20$

[1]

- 2 Amir asked 15 friends how many hours they spent playing sport last weekend. His results are shown in the table below.

|                 |   |   |   |   |   |   |
|-----------------|---|---|---|---|---|---|
| Number of hours | 0 | 1 | 2 | 3 | 4 | 5 |
| Frequency       | 6 | 2 | 3 | 1 | 2 | 1 |

- (a) Write down the mode.

..... hours [1]

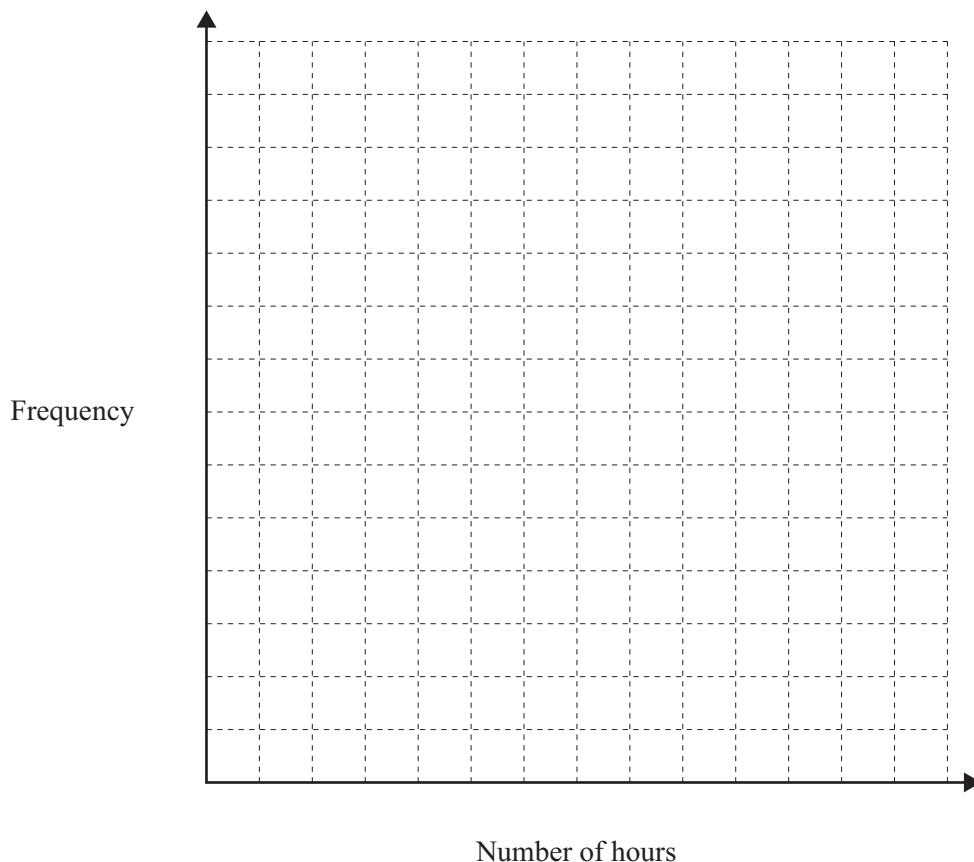
- (b) Find the median.

..... hours [1]

- (c) Calculate the mean.

..... hours [3]

- (d) On the grid, draw a bar chart to show the information given in the table.



3 Ravi sells cars.

(a) He has a total of 144 cars for sale.

(i) 64 of these cars are 3 or more years old.

What fraction of the cars are **less than** 3 years old?

Give your answer in its simplest form.

..... [2]

(ii) Some of the 144 cars use petrol, some use diesel and some are electric cars.

The ratio of petrol to diesel to electric cars is 6 : 5 : 1.

Work out the number of these cars that use diesel.

..... [2]

(b) Lola buys a car from Ravi.

There are two ways she can pay for the car.

Option 1: one payment of £5200.

Option 2: a payment of  $\frac{2}{5}$  of £5200 plus 24 monthly payments, each of £175.

Work out how much **more** Lola would pay using Option 2 than Option 1.

£ ..... [3]

- (c) For one week, Ravi reduces all his car prices by 15%.  
The price of a car was £3450.

Show that the reduced price of the car is £2932.50.

[2]

- (d) Ravi borrows £35 000 for 3 years from a bank to buy some more cars.  
The bank charges compound interest at a rate of 8% per year.

Find the **total** amount Ravi must pay back after 3 years.

£ ..... [3]

- 4 The table shows some opening and closing times of a café.

|              | Mon  | Tue  | Wed  | Thu  | Fri  | Sat  | Sun  |
|--------------|------|------|------|------|------|------|------|
| Opening time | 0600 | 0600 | 0600 | 0600 | 0600 |      | 0800 |
| Closing time | 2200 | 2200 | 2200 | 2200 | 2200 | 2200 | 1300 |

- (a) The café is open for a total of 100 hours each week.

Work out the opening time on Saturday.

..... [2]

- (b) The owner decides to close the café at a later time on Sunday.  
This increases the **total** number of hours the café is open by 4%.

Work out the new closing time on Sunday.

..... [1]

5 (a) A shop has maps arranged on bookcases.

- (i) The length of one wall in the shop is 7.35 m.  
Each bookcase is 120 cm wide.

Work out the maximum number of bookcases that will fit along this wall.

..... [2]

- (ii) Each bookcase weighs 45 kg correct to the nearest 5 kg.

Write down the upper bound for the weight of a bookcase.

..... kg [1]

- (b) The shopkeeper buys a map for £5.50.  
He sells the map for £6.60.

- (i) Calculate his percentage profit.

..... % [3]

- (ii) The price of a map is written in pounds (£) and in euros (€).



Work out the value of €1 in pounds.

€1 = £ ..... [2]

- 6 Lee is making a pond in his garden.

- (a) He has a maximum of £100 to spend on a water pump for the pond.  
The pump must have a flow rate of at least 250 litres per minute.

His local garden centre has four water pumps for sale.

| Pump | Cost    | Flow rate              |
|------|---------|------------------------|
| A    | £92.50  | 4.1 litres per second  |
| B    | £104.99 | 4.4 litres per second  |
| C    | £80.75  | 13 000 litres per hour |
| D    | £89.99  | 18 000 litres per hour |

Which water pump should he buy?

Show how you decide.

..... [4]

- (b) Lee's pond holds 20 500 litres of water.  
The pond is filled at a rate of 10 litres per minute.

The flow diagram below can be used to work out how many days it will take to fill Lee's pond.

$$x \Rightarrow \boxed{\div 10} \Rightarrow \boxed{\div 1440} \Rightarrow y$$

- (i) Explain why the number 1440 is used in the flow diagram.

..... [1]

- (ii) For Lee's pond, find the value of  $x$  and the value of  $y$ .

$x = \dots$

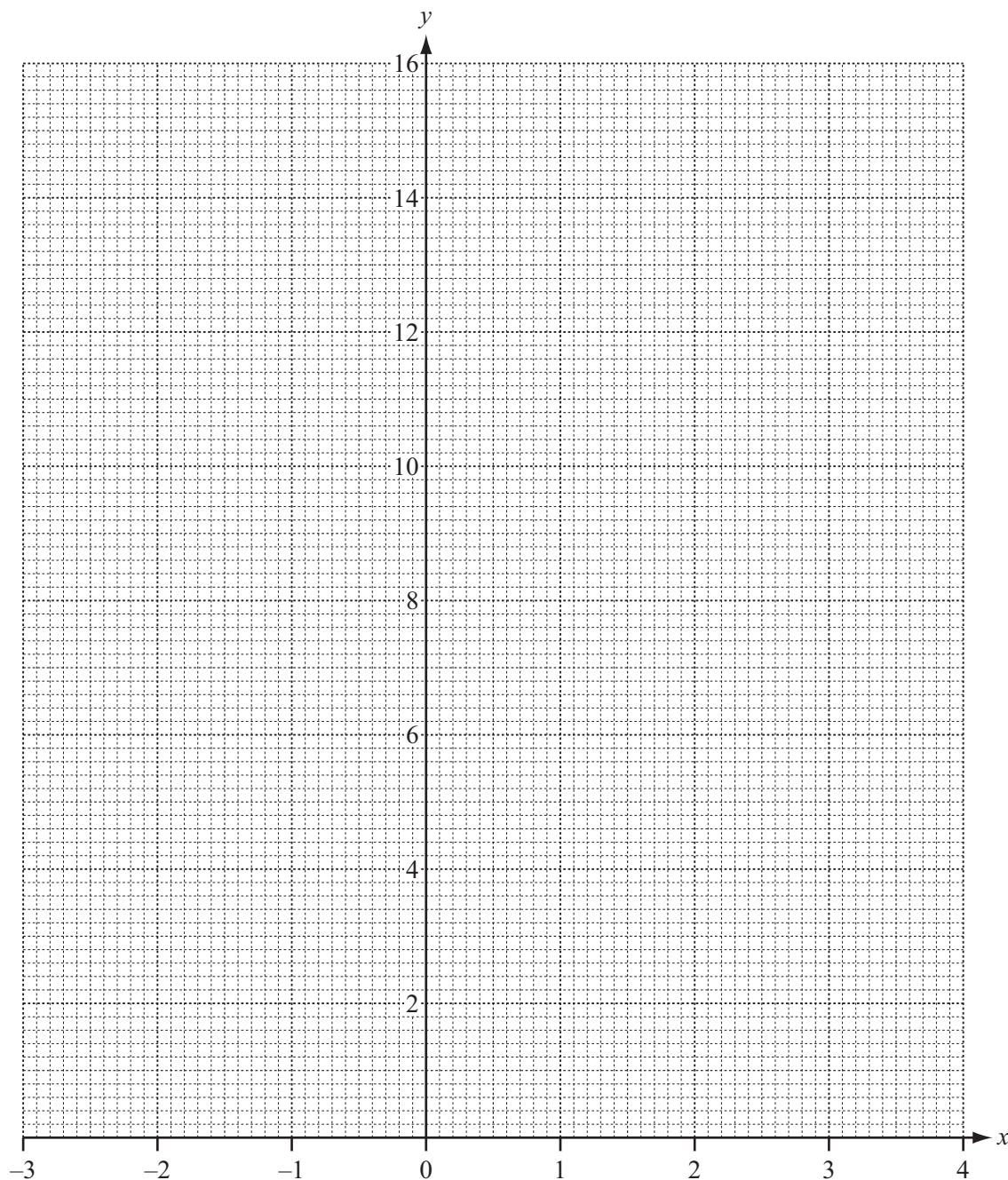
$y = \dots$  [2]

- 7 (a) Complete the table of values for  $y = x^2 - x + 2$ .

|     |    |    |    |   |   |   |   |   |
|-----|----|----|----|---|---|---|---|---|
| $x$ | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 |
| $y$ |    | 8  |    | 2 |   | 4 |   |   |

[3]

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



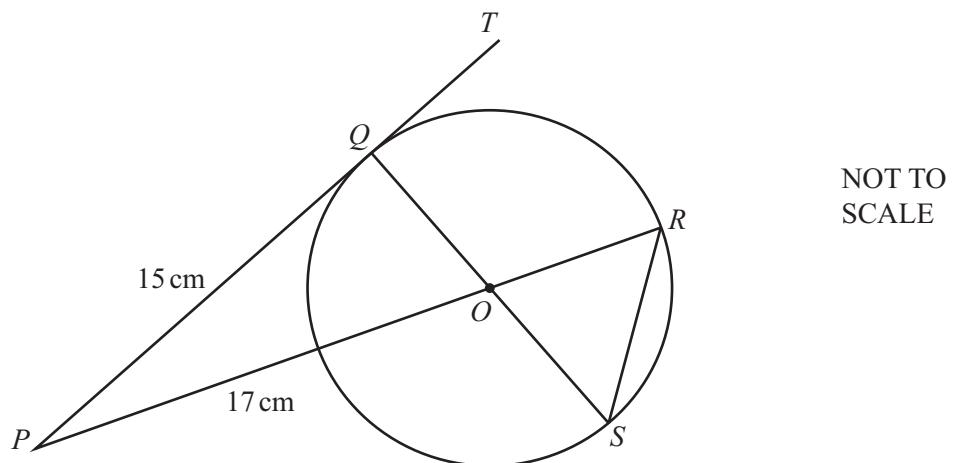
[4]

(c) Write down the equation of the line of symmetry of the graph.

..... [1]

(d) Use your graph to solve the equation  $x^2 - x + 2 = 9$ .

$x = \dots$  or  $x = \dots$  [3]



The diagram shows a circle, centre  $O$ .  
 $Q$ ,  $R$  and  $S$  are points on the circumference.  
 $PT$  is a tangent to the circle at  $Q$ .  
 $PQ = 15$  cm and  $OP = 17$  cm.

- (a) Explain why angle  $OQT = 90^\circ$

..... [1]

- (b) Calculate the radius of the circle.

..... cm [3]

- (c) Using trigonometry, show that angle  $OPQ = 28^\circ$ , correct to the nearest degree.

[2]

- (d) Work out the size of angle  $ORS$ , giving a reason for each step of your answer.

[3]

- 9 (a) Write down the next term and the **term-to-term** rule for the following sequences.

(i)  $4, 2, 1, \frac{1}{2}, \dots$

Next term ..... term-to-term rule ..... [2]

(ii)  $5, -10, 20, -40, \dots$

Next term ..... term-to-term rule ..... [2]

- (b) (i) Write down the next two terms of this sequence.

$5, 13, 21, 29, \dots, \dots$  [2]

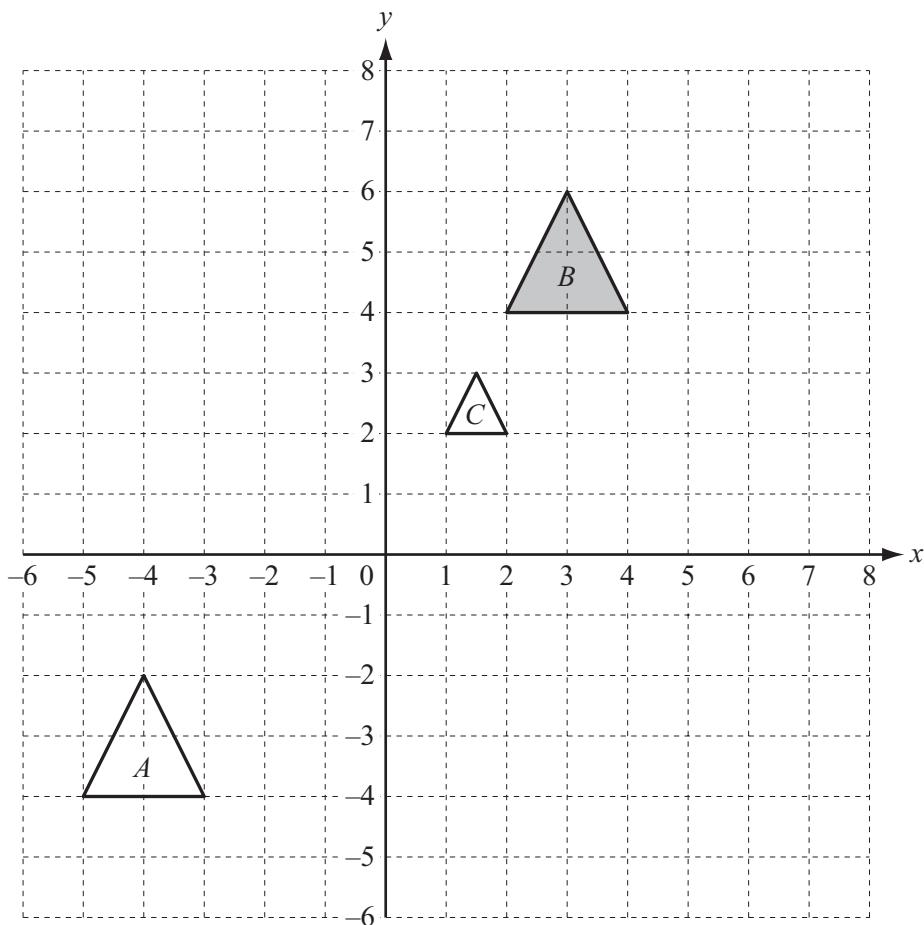
- (ii) Write down the  $n$ th term of this sequence.

..... [2]

- (iii) Find the 100th term.

..... [1]

10



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

..... [2]

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

..... [3]

- (b) Reflect shape *B* in the *y*-axis.

[1]

- 11 Jenny rolls two ordinary 6-sided dice and adds together the scores on the two dice. She works out the probability of getting a total of 4 when she rolls the two dice. Here is her working.

$1 + 3 = 4$  and  $2 + 2 = 4$   
There are two ways of getting 4

$$\begin{array}{ll} 1 + 1 & 2 + 1 \\ 1 + 2 & 2 + 2 \\ 1 + 3 & 2 + 3 \\ 1 + 4 & 2 + 4 \\ 1 + 5 & 2 + 5 \\ 1 + 6 & 2 + 6 \end{array}$$

There are 12 different pairs altogether

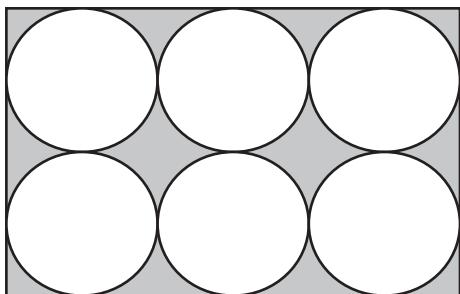
Probability of getting a total of 4 is  $\frac{2}{12}$

Jenny is incorrect.

Explain her errors and show clearly how to work out the correct answer.

[5]

- 12 (a) Six identical circles fit exactly in this rectangle as shown in the diagram.



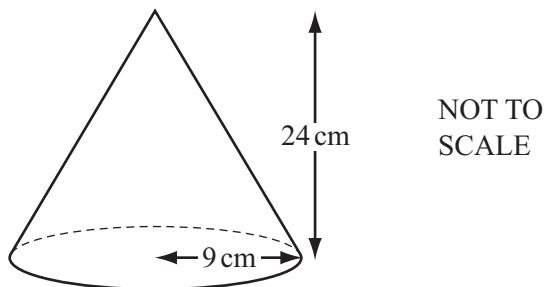
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The perimeter of the rectangle is 120 cm.

Calculate the shaded area.

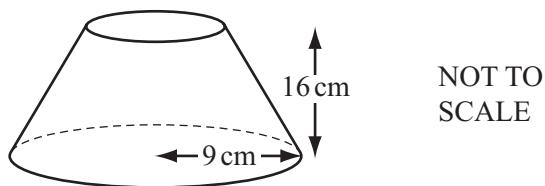
.....  $\text{cm}^2$  [5]

(b)



A solid metal cone has base radius 9 cm and vertical height 24 cm.

A cone of base radius 3 cm and vertical height 8 cm is removed by cutting parallel to the base. The new solid is shown below.



Show that the volume of this solid rounds to  $1960 \text{ cm}^3$ , correct to 3 significant figures.

[The volume,  $V$ , of a cone with radius  $r$  and height  $h$  is  $V = \frac{1}{3}\pi r^2 h$ .]

[5]

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