



# Cambridge IGCSE™

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**MATHEMATICS**

**0580/03**

Paper 3 (Core)

**For examination from 2020**

SPECIMEN PAPER

**2 hours**

You must answer on the question paper.

You will need: Geometrical instruments

## INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should use a calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For  $\pi$ , use either your calculator value or 3.142.

## INFORMATION

- The total mark for this paper is 104.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **18** pages. Blank pages are indicated.

- 1 (a) The table shows part of a bus timetable.

|                |       |       |       |       |
|----------------|-------|-------|-------|-------|
| Town Hall      | 10 15 | 10 35 | 10 55 | 11 15 |
| City Gate      | 10 32 | 10 52 | 11 12 | 11 32 |
| Beacon Hill    | 10 58 | 11 18 | 11 38 | 11 58 |
| Kingswood Park | 11 10 | 11 30 | 11 50 | 12 10 |

- (i) Yana leaves home at 10 50.  
She takes 14 minutes to walk to the bus stop at City Gate.

At what time does she reach the bus stop?

..... [1]

- (ii) She gets on the next bus at City Gate and travels to Kingswood Park.

At what time does this bus arrive at Kingswood Park?

..... [1]

- (iii) Work out how many minutes the bus takes to get from City Gate to Kingswood Park.

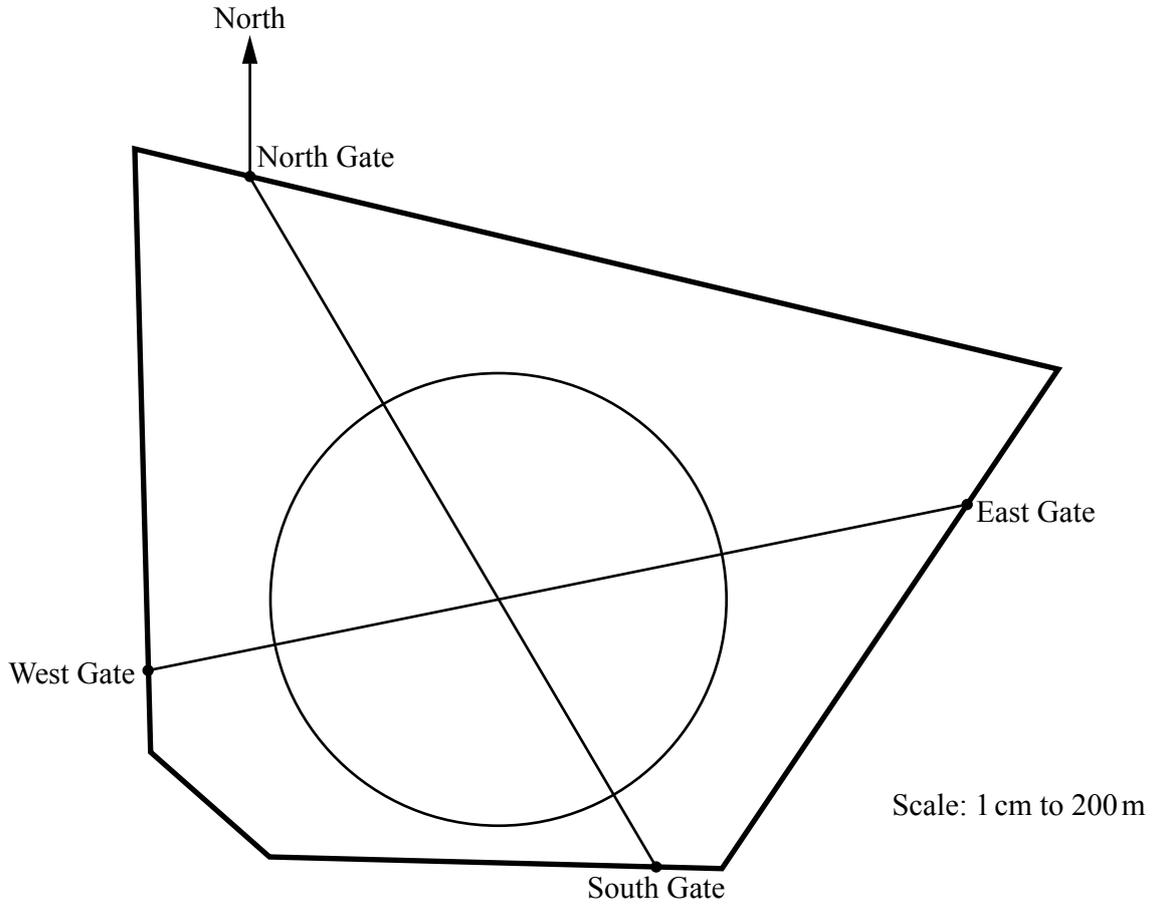
..... min [1]

- (b) Ivan walks 1.5 km from his home to Kingswood Park.  
He takes 20 minutes.

Work out Ivan's average speed in kilometres per hour.

..... km/h [1]

- (c) The scale drawing shows a map of Kingswood Park. There are two straight paths and one circular path. The scale is 1 cm represents 200 m.



- (i) Yana walks along the straight path from East Gate to West Gate.

Work out the distance she walks.  
Give your answer in kilometres.

..... km [2]

- (ii) Measure the bearing of South Gate from North Gate.

..... [1]

- (iii) The entrance, P, to a children's play area is 500 metres from North Gate on a bearing of  $195^\circ$ .

Mark the position of P on the map. [2]

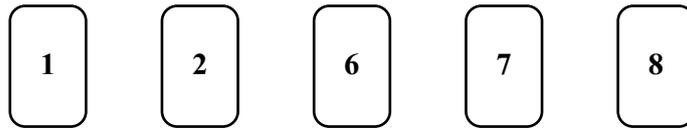
- (iv) Ivan runs once around the circular path.

Calculate the distance Ivan runs.

..... m [4]

[Turn over

- 2 (a) The diagram shows five number cards.



Put two cards side by side to show

- (i) a two-digit number that is a multiple of 7,

[1]

- (ii) a two-digit square number,

[1]

- (iii) a two-digit cube number,

[1]

- (iv) a two-digit prime number.

[1]

- (b) Insert one pair of brackets into this statement to make it correct.

$$7 \times 5 - 2 + 3 = 42 \quad [1]$$

- (c) (i) Write 60 as a product of its prime factors.

..... [2]

(ii) Find the lowest common multiple (LCM) of 36 and 60.

..... [2]

(d) Find the value of  $\sqrt[3]{0.729}$ .

..... [1]

3 Joel spins a fair five-sided spinner numbered 2, 3, 4, 5 and 6.

(a) Write down the probability that the spinner lands on

(i) an odd number,

..... [1]

(ii) a prime number,

..... [1]

(iii) the number 7.

..... [1]

(b) The table shows the results of his first 20 spins.

|           |   |   |   |   |   |
|-----------|---|---|---|---|---|
| Number    | 2 | 3 | 4 | 5 | 6 |
| Frequency | 3 | 2 | 6 | 4 | 5 |

(i) Write down the mode.

..... [1]

(ii) Calculate the mean.

..... [3]

(iii) Joel wants to draw a pie chart to show the results in the table.

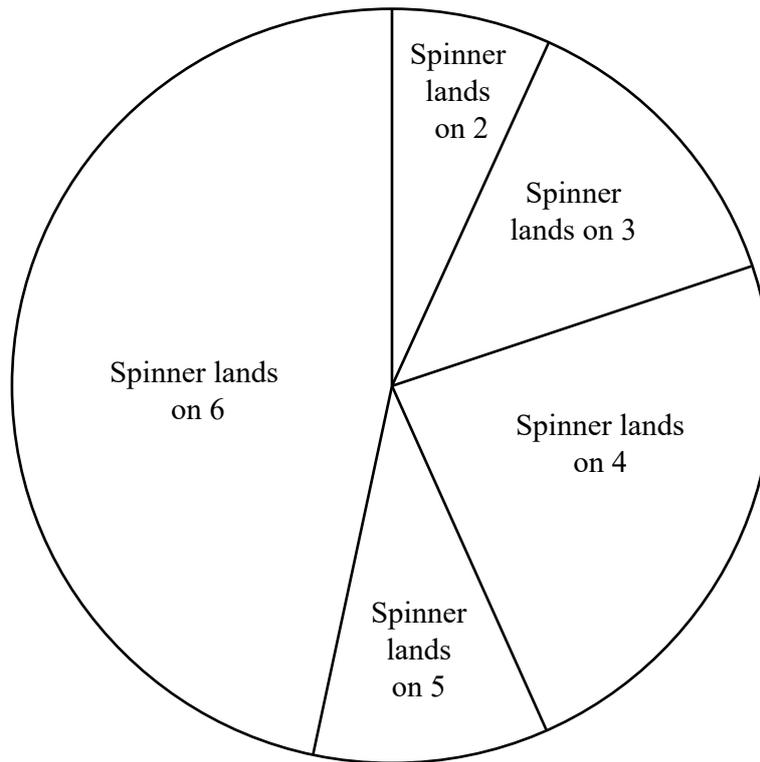
(a) Show that the sector angle for the number 2 is  $54^\circ$ .

[1]

(b) Find the sector angle for the number 6.

..... [2]

- (c) Joel asks 30 students to guess the number that the spinner will land on next. This pie chart shows the results.



- (i) The sector angle for the number 6 is  $168^\circ$ .

How many students guessed the number 6?

..... [2]

- (ii) Find the percentage of the students who guessed a number **less than 5**.

.....% [3]

- (iii) Joel spins the spinner.  
10% of the students guessed correctly.

Which number did the spinner land on?

..... [2]

4 (a) A farmer has 45 horses and 20 cows.

- (i) Write this as a ratio of horses : cows.  
Give your answer in its simplest form.

..... : ..... [1]

- (ii) The farmer wants the ratio of horses : cows to equal 5 : 3.  
He keeps his 45 horses and buys some more cows.

Work out the number of cows he must buy.

..... [2]

(b) Six years ago the farmer invested \$3750 at a rate of 4% per year compound interest.

- (i) Calculate the total value of his investment after the 6 years.  
Give your answer correct to the nearest dollar.

\$ ..... [3]

- (ii) The farmer wants to spend his investment on buying goats.  
Goats cost \$126 each.

Work out the maximum number of goats he can buy **and** the amount of money left over.

Number of goats .....

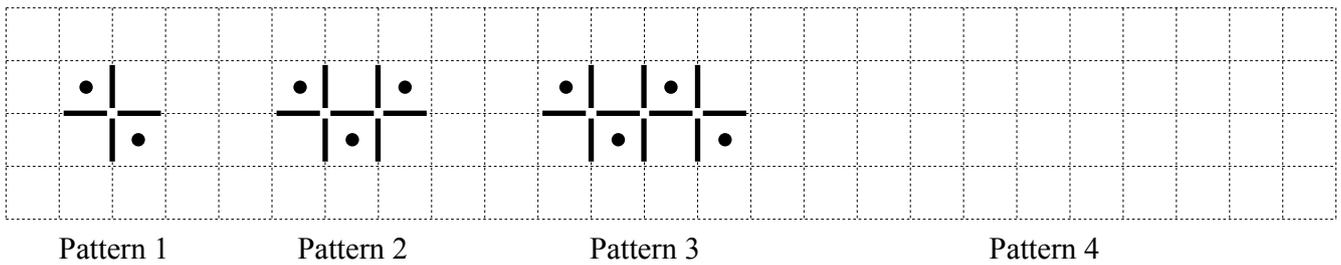
Amount of money left over \$ ..... [4]

- (c) The farmer grows carrots.  
In 2018 the selling price for carrots was \$96 per tonne.  
In 2019 this selling price increased by 18%.

Work out the increase in the selling price from 2018 to 2019.

\$ ..... [1]

5 A sequence of patterns is made using lines and dots.  
The first three patterns in the sequence are shown below.



(a) Draw Pattern 4 on the grid. [1]

(b) Complete the table.

|                 |   |   |   |   |  |    |
|-----------------|---|---|---|---|--|----|
| Pattern         | 1 | 2 | 3 | 4 |  | 10 |
| Number of dots  | 2 | 3 |   |   |  |    |
| Number of lines | 4 | 7 |   |   |  |    |

[4]

(c) Find an expression, in terms of  $n$ , for

(i) the number of dots in Pattern  $n$ ,

..... [1]

(ii) the number of lines in Pattern  $n$ .

..... [2]

(d) A pattern has 76 lines.

Work out how many **dots** are in this pattern.

..... [2]

6 (a) Solve these equations.

(i)  $x + 7 = 15$

$x = \dots\dots\dots$  [1]

(ii)  $5(3x + 8) = 10$

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

(b) A club is arranging transport for its members.

Speedy Coaches charge \$625 plus \$15 per member.

The total cost, in dollars, for  $x$  members is given by the expression  $15x + 625$ .

(i) Sporty Coaches charge \$117 plus \$19 per member.

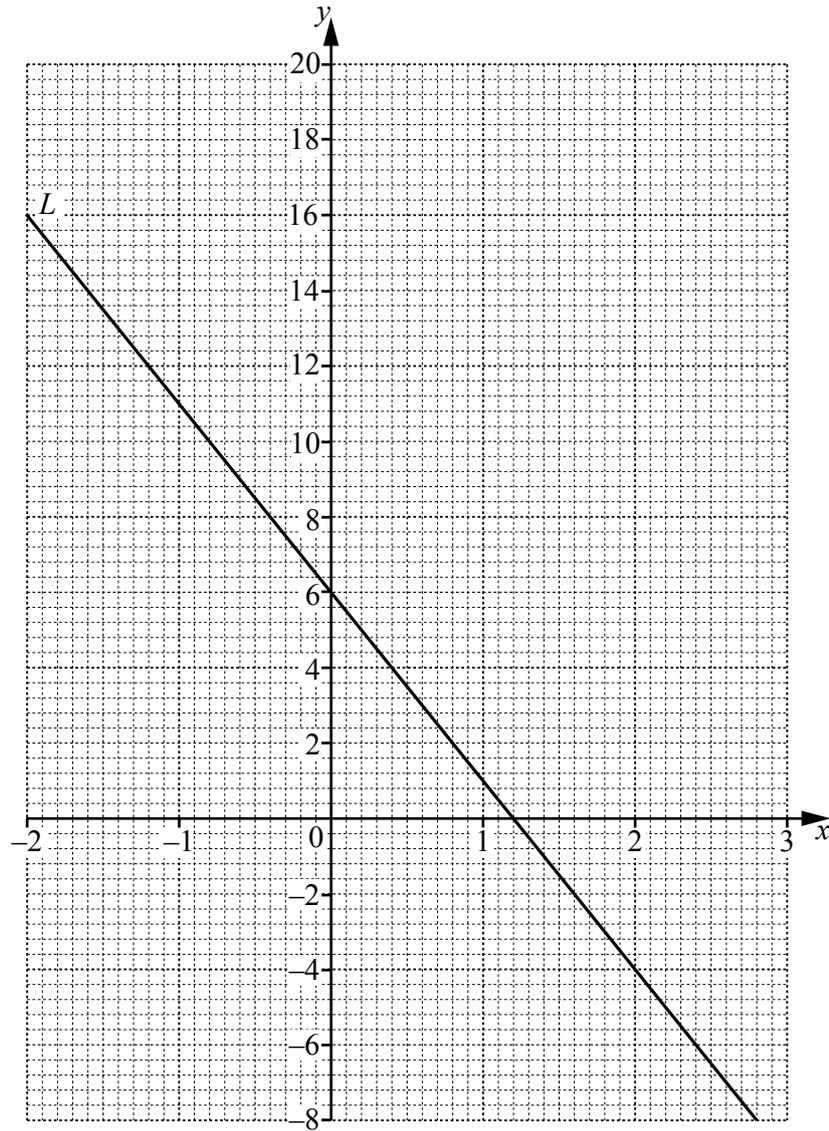
Write an expression for the total cost, in dollars, for  $x$  members.

$\dots\dots\dots$  [2]

(ii) The total cost is the same for both Speedy Coaches and Sporty Coaches.

Write down an equation and solve it to find  $x$ .

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



(a) The line  $L$  is shown on the grid.

Find the equation of the line in the form  $y = mx + c$ .

$y = \dots\dots\dots$  [3]

(b) (i) Complete the table of values for  $y = x^2 + 2x + 4$ .

|     |    |    |   |   |   |    |
|-----|----|----|---|---|---|----|
| $x$ | -2 | -1 | 0 | 1 | 2 | 3  |
| $y$ | 4  |    | 4 | 7 |   | 19 |

[2]

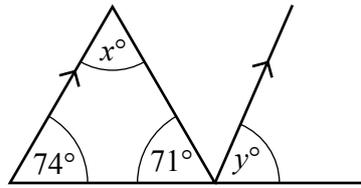
(ii) On the grid opposite, draw the graph of  $y = x^2 + 2x + 4$  for  $-2 \leq x \leq 3$ .

[4]

(c) For  $-2 \leq x \leq 3$ , write down the  $x$ -coordinate of the point of intersection of the line  $L$  with the curve  $y = x^2 + 2x + 4$ .

$x = \dots\dots\dots$  [1]

8 (a)



NOT TO SCALE

Work out the value of

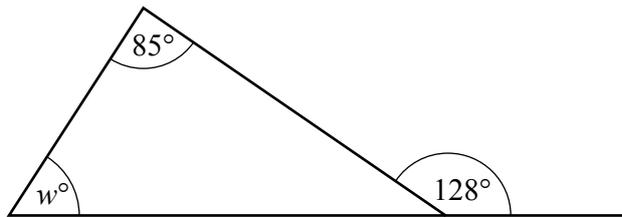
(i)  $x$ ,

$x = \dots\dots\dots$  [1]

(ii)  $y$ .

$y = \dots\dots\dots$  [1]

(b)

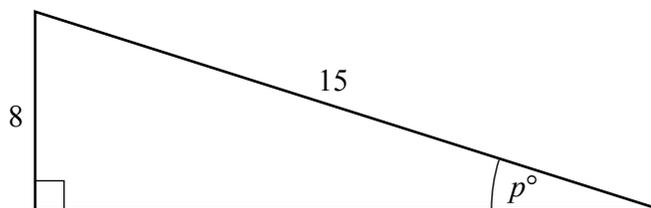


NOT TO SCALE

Work out the value of  $w$ .  
Give reasons for your answer.

$w = \dots\dots\dots$  because  $\dots\dots\dots$   
 $\dots\dots\dots$  [3]

(c)

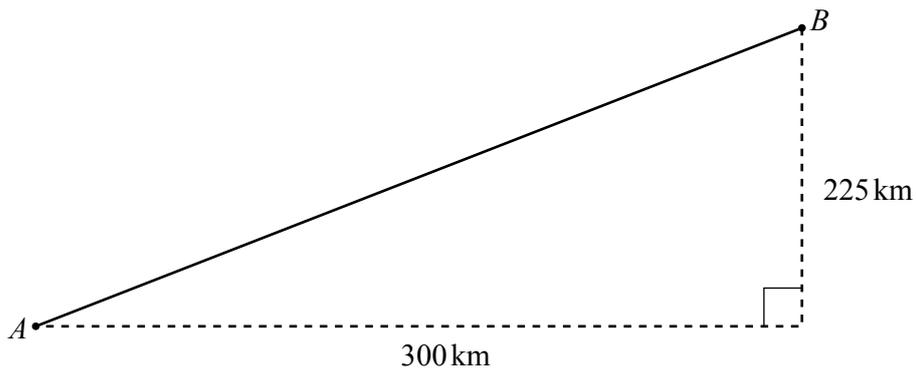


NOT TO SCALE

Use trigonometry to calculate the value of  $p$ .

$p = \dots\dots\dots$  [2]

(d) The diagram shows the path of a plane from airport  $A$  to airport  $B$ .



NOT TO  
SCALE

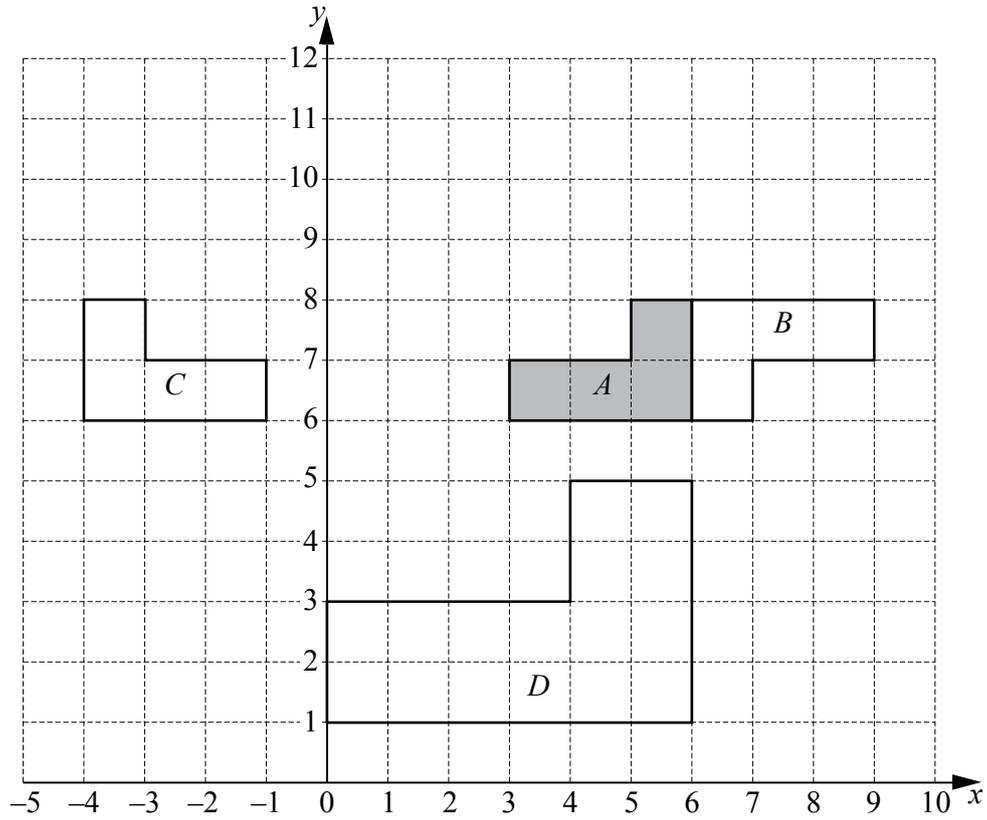
(i) Show that the distance between  $A$  and  $B$  is 375 km.

[2]

(ii) The plane flies at an average speed of 450 km/h.  
It leaves  $A$  at 1445 and flies directly to  $B$ .

Work out the time the plane arrives at  $B$ .

..... [4]  
[Turn over



The diagram shows four shapes *A*, *B*, *C* and *D*.

(a) Describe fully the **single** transformation that maps shape *A* onto

(i) shape *B*,

.....  
 ..... [3]

(ii) shape *C*,

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

(iii) shape *D*.

.....  
 ..... [3]

(b) On the grid, draw the image of shape  $A$  after a translation by the vector  $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$ . [2]

(c) Which shapes, if any, are congruent to shape  $D$ ?  
Give a reason for your answer.

..... [1]

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