



# Cambridge IGCSE™

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**MATHEMATICS**

**0580/22**

Paper 2 (Extended)

**October/November 2020**

**1 hour 30 minutes**

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 70.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **12** pages. Blank pages are indicated.

- 1 Write two hundred thousand and seventeen in figures.

..... [1]

- 2 Insert one pair of brackets to make this calculation correct.

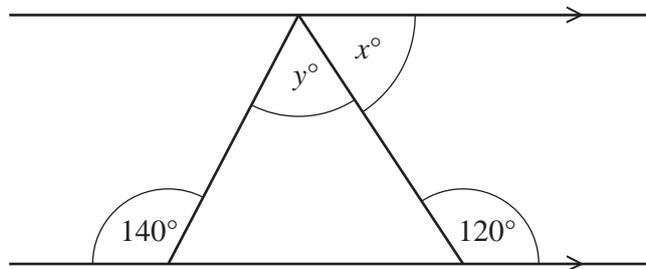
$$7 - 5 - 3 + 4 = 9 \quad [1]$$

- 3 Solve the equation.

$$6 - 2x = 3x$$

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

4



NOT TO  
SCALE

The diagram shows a triangle drawn between a pair of parallel lines.

Find the value of  $x$  and the value of  $y$ .

$x =$  .....

$y =$  ..... [3]

- 5 Increase 42 by 16%.

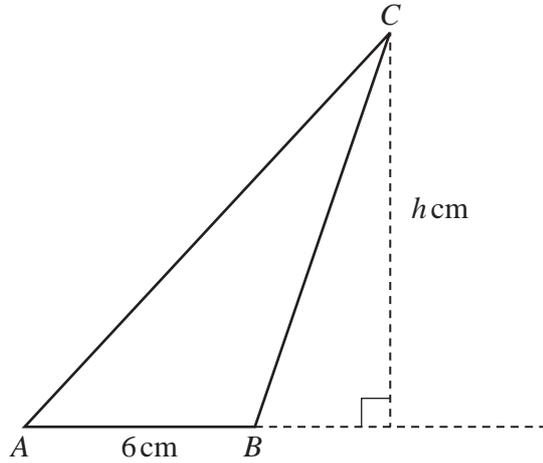
..... [2]

6 Factorise completely.

$$4 - 8x$$

..... [1]

7



NOT TO SCALE

The area of triangle  $ABC$  is  $27 \text{ cm}^2$  and  $AB = 6 \text{ cm}$ .

Calculate the value of  $h$ .

$h =$  ..... [2]

8 Calculate the size of one interior angle of a regular polygon with 40 sides.

..... [2]

9 Solve the simultaneous equations.

$$2x + y = 7$$

$$3x - y = 8$$

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots [2]$$

10 Without using a calculator, work out  $\frac{5}{6} \div 1\frac{1}{3}$ .

You must show all your working and give your answer as a fraction in its simplest form.

$$\dots\dots\dots [3]$$

11 Simplify.

$$2x^2 \times 5x^5$$

$$\dots\dots\dots [2]$$

- 12** Alex and Chris share sweets in the ratio Alex : Chris = 7 : 3.  
Alex receives 20 more sweets than Chris.

Work out the number of sweets Chris receives.

..... [2]

- 13** The length of one side of a rectangle is 12 cm.  
The length of the diagonal of the rectangle is 13 cm.

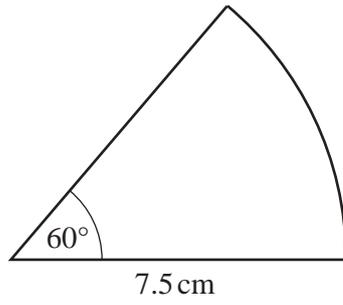
Calculate the area of the rectangle.

..... cm<sup>2</sup> [3]

- 14** Work out  $(3 \times 10^{199}) + (2 \times 10^{201})$ .  
Give your answer in standard form.

..... [2]

15



NOT TO  
SCALE

Calculate the area of this sector of a circle.

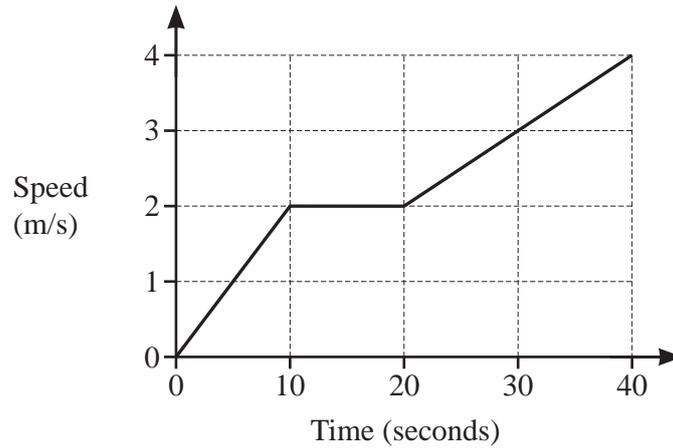
.....  $\text{cm}^2$  [2]

16 The selling price of a shirt is \$26.50 .  
This includes a tax of 6% .

Calculate the price of the shirt before the tax was added.

\$ ..... [2]

17



The diagram shows the speed–time graph for the first 40 seconds of a cycle ride.

(a) Find the acceleration between 20 and 40 seconds.

.....  $\text{m/s}^2$  [1]

(b) Find the total distance travelled.

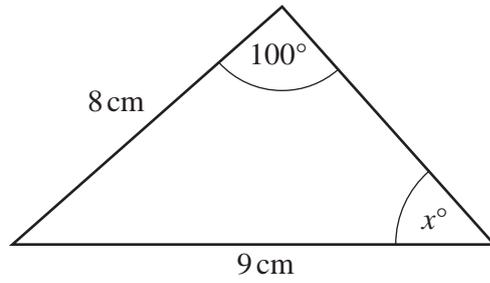
..... m [3]

**18** The sides of an isosceles triangle are measured correct to the nearest millimetre. One side has a length of 8.2 cm and another has a length of 9.4 cm.

Find the largest possible value of the perimeter of this triangle.

..... cm [3]

19

NOT TO  
SCALE(a) Calculate the value of  $x$ . $x = \dots\dots\dots$  [3]

(b) Calculate the area of the triangle.

 $\dots\dots\dots \text{ cm}^2$  [3]

20 A model of a statue has a height of  $4\text{ cm}$ .  
 The volume of the model is  $12\text{ cm}^3$ .  
 The volume of the statue is  $40\,500\text{ cm}^3$ .

Calculate the height of the statue.

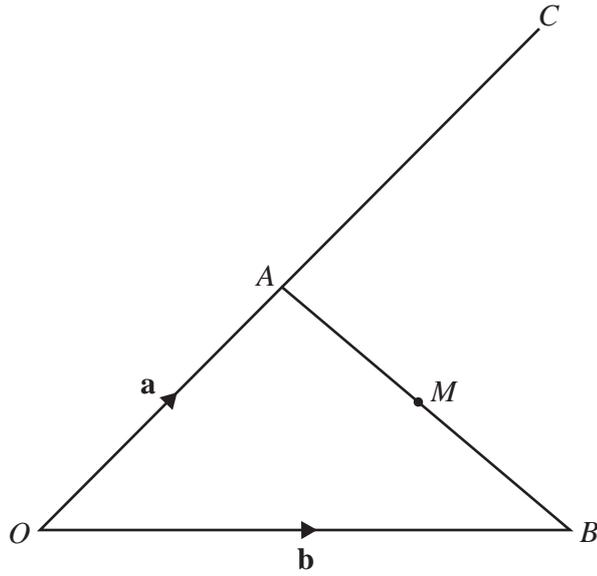
 $\dots\dots\dots \text{ cm}$  [3]

21 (a) Differentiate  $6 + 4x - x^2$ .

..... [2]

(b) Find the coordinates of the turning point of the graph of  $y = 6 + 4x - x^2$ .

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



NOT TO SCALE

The diagram shows a triangle  $OAB$  and a straight line  $OAC$ .  
 $OA : OC = 2 : 5$  and  $M$  is the midpoint of  $AB$ .  
 $\vec{OA} = \mathbf{a}$  and  $\vec{OB} = \mathbf{b}$ .

Find, in terms of  $\mathbf{a}$  and  $\mathbf{b}$ , in its simplest form

(a)  $\vec{AB}$ ,

$$\vec{AB} = \dots\dots\dots [1]$$

(b)  $\vec{MC}$ .

$$\vec{MC} = \dots\dots\dots [3]$$

23 Write as a single fraction in its simplest form.

$$2 - \frac{2x-1}{x+1}$$

..... [3]

24 A line from the point (2, 3) is perpendicular to the line  $y = \frac{1}{3}x + 1$ .  
The two lines meet at the point  $P$ .

Find the coordinates of  $P$ .

( ..... , ..... ) [5]

**Questions 25 and 26 are printed on the next page.**

25 Solve the equation  $\tan x = 2$  for  $0^\circ \leq x \leq 360^\circ$ .

$x = \dots\dots\dots$  or  $x = \dots\dots\dots$  [2]

26 Simplify.

$$\frac{ux - 2u - x + 2}{u^2 - 1}$$

$\dots\dots\dots$  [4]

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