

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 π , 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] | 1 |
|---------|---|
| LI. | J |

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

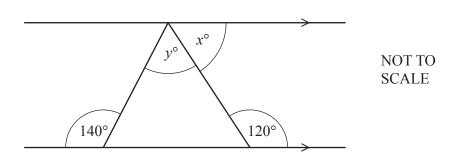
$$7 - 5 - 3 + 4 = 9 ag{1}$$

3 Solve the equation.

$$6 - 2x = 3x$$

 $x = \dots$ [2]

4



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

Find the value of x and the value of y.

$$x = \dots$$

$$y = \dots$$
 [3]

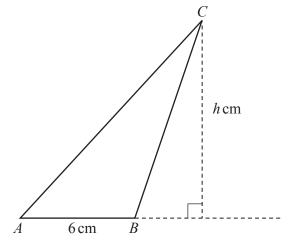
5 Increase 42 by 16%.

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| 6 | Factorise completely. | |
|---|-----------------------|--------|
| | | 1 - Qr |

.....[1]

7



NOT TO SCALE

The area of triangle ABC is 27 cm^2 and AB = 6 cm.

Calculate the value of *h*.

 $h = \dots$ [2]

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

.....[2]

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4

| 9 | Solve the simultaneous equations. | |
|---|-----------------------------------|-------------------------|
| | | 2x + y = 7 $3x - y = 8$ |
| | | 3x - y = 8 |

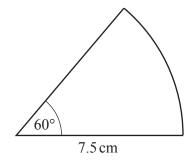
| <i>x</i> = | |
|------------|-----|
| <i>y</i> = | [2] |

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.



11 Simplify. $2x^2 \times 5x^5$

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



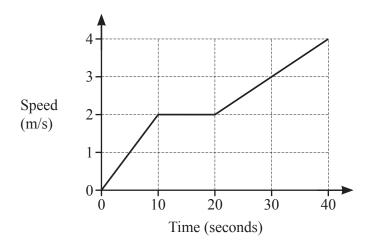
NOT TO SCALE

Calculate the area of this sector of a circle.

| cm ² | [2 |
|-----------------|----|
| cm- | [4 |

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.



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.

| / ₋ 2 | Г17 |
|------------------|-----|
| m/s | [I] |

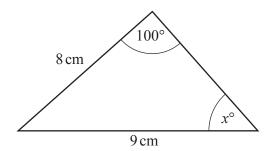
(b) Find the total distance travelled.

| m | ₁ [3] |
|---|------------------|
| | L LJ |

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]



NOT TO SCALE

(a) Calculate the value of x.

 $x = \dots$ [3]

(b) Calculate the area of the triangle.

..... cm² [3]

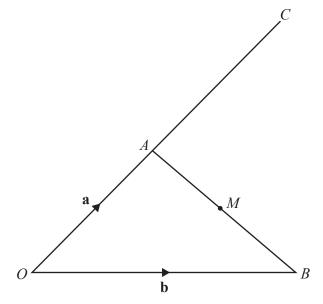
20 A model of a statue has a height of 4 cm. The volume of the model is 12 cm³. The volume of the statue is 40 500 cm³.

Calculate the height of the statue.

..... cm [3]

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|-----------------------------------------------------------|-----------|---------|--------|
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| 21 | (a) | Differentiate $6+4x-x^2$. | |
|----|-----|--------------------------------------------------------------------------------|-----|
| | (b) | Find the coordinates of the turning point of the graph of $y = 6 + 4x - x^2$. | [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. $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OB} = \mathbf{b}$.

Find, in terms of a and b, in its simplest form

(a) \overrightarrow{AB} ,

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

(b) \overrightarrow{MC} .

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

| | 23 | Write as a | single | fraction | in its | simplest | form |
|--|----|------------|--------|----------|--------|----------|------|
|--|----|------------|--------|----------|--------|----------|------|

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

|--|

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.

Questions 25 and 26 are printed on the next page.

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

$$x =$$
 or $x =$ [2]

26 Simplify.

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

.....[4]

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