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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.

2

- 1 Write two hundred thousand and seventeen in figures.

..... [1]

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

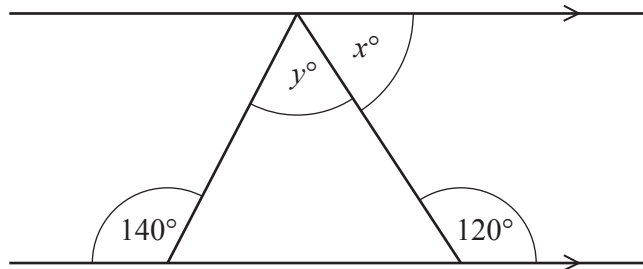
$$7 - 5 - 3 + 4 = 9 \quad [1]$$

- 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%.

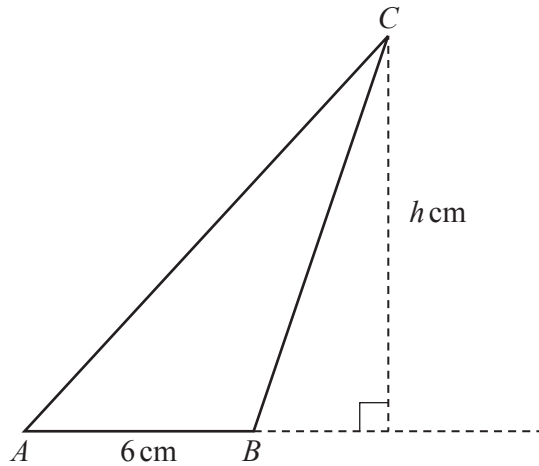
..... [2]

6 Factorise completely.

$$4 - 8x$$

..... [1]

7



NOT TO SCALE

The area of triangle ABC is 27 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.

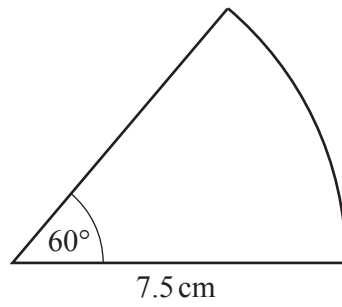
..... cm² [3]

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

..... [2]

6

15

NOT TO
SCALE

Calculate the area of this sector of a circle.

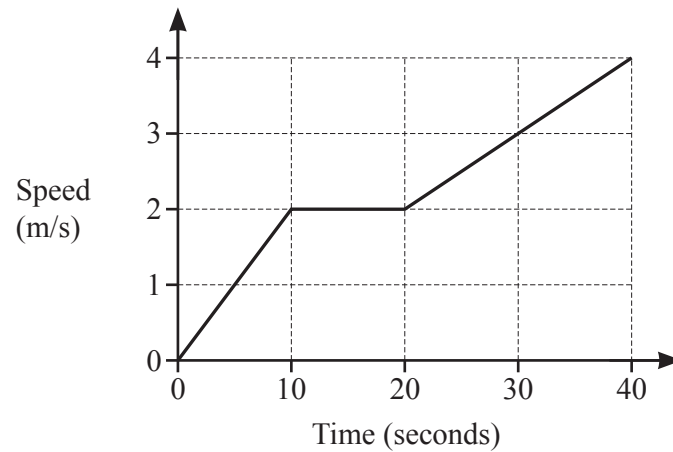
..... cm^2 [2]

- 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.

..... m/s^2 [1]

(b) Find the total distance travelled.

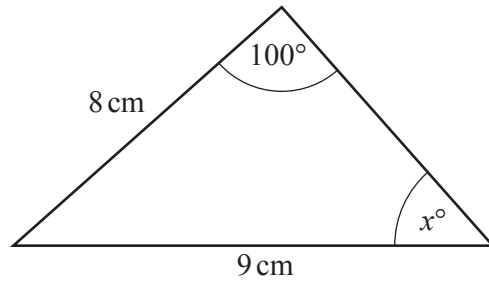
..... m [3]

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 cm .
 The volume of the model is 12 cm^3 .
 The volume of the statue is $40\,500\text{ cm}^3$.

Calculate the height of the statue.

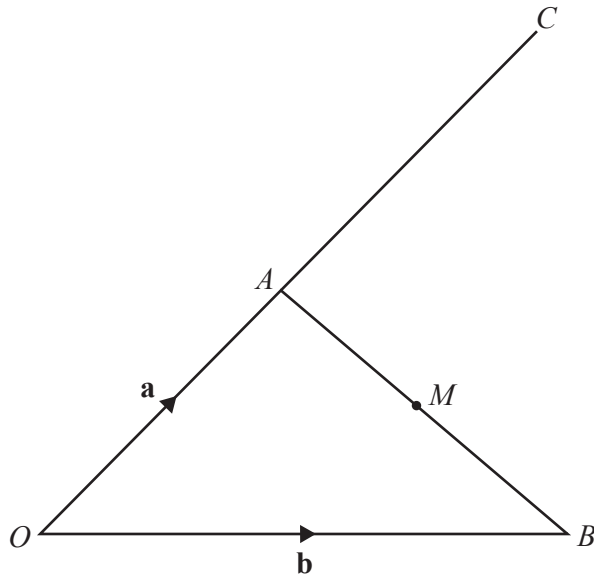
$\dots\dots\dots\text{ cm}$ [3]

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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