Cambridge Assessment International Education

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2897957022

MATHEMATICS **0580/23**

Paper 2 (Extended) **October/November 2021**

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 [ ].

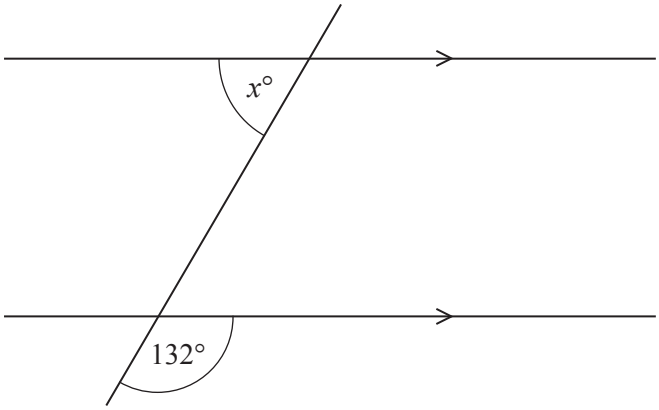
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1 Write 26 g as a percentage of 208 g.

..... % [1]

2



NOT TO SCALE

The diagram shows two parallel lines intersecting a straight line.

Find the value of x.

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

3

11 13 15 17 19

From this list, write down the number that is both a prime number and a factor of 195.

..... [1]

4 **(a)** = ≠ > <

Put a ring around each of the symbols that make this statement correct.

0.5 ..... 5% [1]

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

$7 - 3 - 1 + 2 = 7$ [1]

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5 Nina changes 153 euros into dollars when the exchange rate is \$1 = 0.9 euros.

Calculate the amount Nina receives.

\$ ..... [1]

6 Marek buys a computer for \$420.
He sells it at a loss of 15%.

Calculate the selling price of this computer.

\$ ..... [2]

7 Simplify.

$32g^{32} \div 4g^{4}$

..... [2]

8 Beatrice walks 1 km at a speed of 4 km/h and then 2 km at a speed of 4.5 km/h.

Work out Beatrice's average speed for the whole journey.

..... km/h [3]

9 Write the recurring decimal $0.\dot{2}\dot{7}$ as a fraction.

..... [1]

10 These are the first four terms of a sequence.

$$3 \quad -1 \quad -5 \quad -9$$

(a) Find the next term in this sequence.

..... [1]

(b) Find the nth term.

..... [2]

11 $P = M(g^2 + h^2)$

(a) Find the value of P when $M = 100$, $g = 3$ and $h = 4.5$.

$P =$ ..... [2]

(b) Rearrange the formula to write g in terms of P, M and h.

$g =$ ..... [3]

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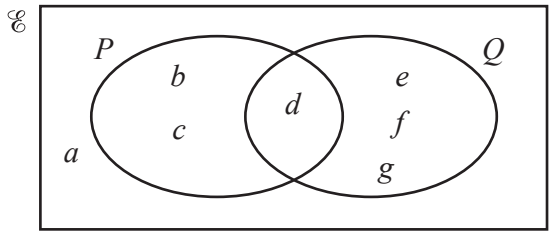
12 **Without using a calculator**, work out $\frac{11}{12} + \frac{3}{4}$.
You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

13 Calculate $0.04^2 + 0.03 \times 0.28$.
Give your answer in standard form.

..... [2]

14



(a) Complete the statement.

$P \cup Q = \{$ ..... $\}$ [1]

(b) Find $n(Q)$.

..... [1]

(c) Find $n(P' \cap Q)$.

..... [1]

15 The cost of a train journey is increased by 6% to a new cost of \$153.70 .

Calculate the original cost of the train journey.

\$ ..... [2]

16 Jo and Mo share \$26.
Jo receives \$5 more than Mo.

Find the ratio Jo's money : Mo's money.
Give your answer in its simplest form.

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

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17 Each interior angle of a regular polygon is 178.5°.

Calculate the number of sides of this polygon.

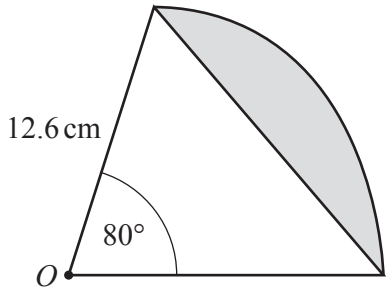
..... [2]

18 Find the equation of the straight line that passes through the points (2, −2) and (3, 10).

Give your answer in the form $y = mx + c$.

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

19



NOT TO SCALE

The diagram shows a sector of a circle, centre O, radius 12.6 cm.

Calculate the perimeter of the shaded segment.

..... cm [4]

20 A lake has an area of 3 km^2.
On a map the area of the lake is 18.75 cm^2.

Find the scale of the map in the form 1 : n.

1 : ..... [3]

21 Simplify fully.

$$\left(243y^{10}\right)^{\frac{3}{5}}$$

..... [2]

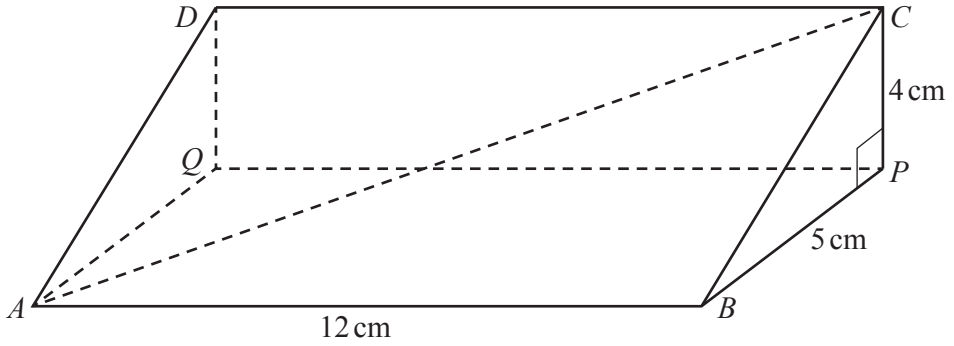
22 Solve the simultaneous equations.
You must show all your working.

$$y = x^2 - 3x - 13$$
$$y = x - 1$$

$x =$ ..... , $y =$ .....

$x =$ ..... , $y =$ ..... [5]

23



NOT TO SCALE

The diagram shows a triangular prism.
Angle $BPC = 90°$.

(a) Calculate AC.

$AC =$ ..... cm [3]

(b) Calculate the angle between AC and the base $ABPQ$.

..... [3]

24 $\tan x = \sqrt{3}$ and $0° \leqslant x \leqslant 360°$.

Find all the possible values of x.

..... [2]

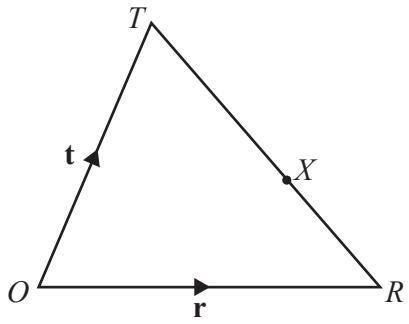
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25 Simplify.

$$\frac{3x^2 - 18x}{ax - 6a + 2cx - 12c}$$

..... [4]

26



NOT TO SCALE

ORT is a triangle.
X is a point on *TR* so that $TX : XR = 3 : 2$.
O is the origin, $\overrightarrow{OR} = \mathbf{r}$ and $\overrightarrow{OT} = \mathbf{t}$.

Find the position vector of *X*.
Give your answer in terms of **r** and **t** in its simplest form.

..... [3]

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