



CANDIDATE  
NAME

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CENTRE  
NUMBER

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CANDIDATE  
NUMBER

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## 0580/23

October/November 2021

**1 hour 30 minutes**

You will need: Geometrical instruments

- 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.

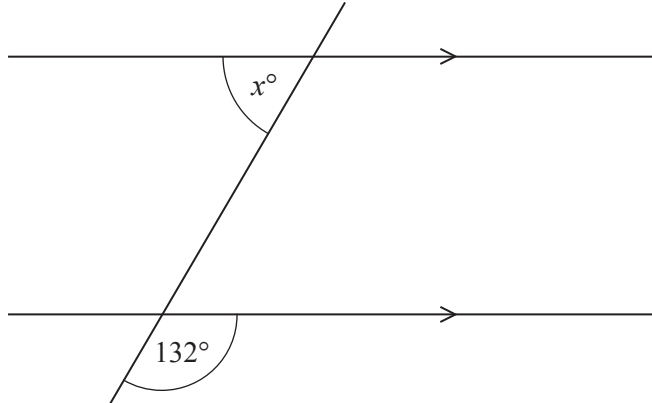
- The total mark for this paper is 70.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **12** pages. Any blank pages are indicated.

- 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)    =     $\neq$     >    <

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]

- 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    -1    -5    -9

- (a) Find the next term in this sequence.

..... [1]

- (b) Find the  $n$ th 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]

5

- 12 Without using a calculator, work out  $\frac{11}{12} + \frac{3}{4}$ .

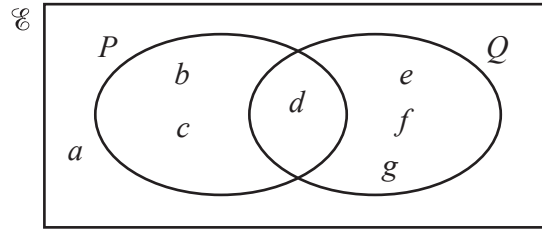
You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

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

..... [2]

14



(a) Complete the statement.

$$P \cup Q = \{ \dots \} \quad [1]$$

(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]

7

- 17 Each interior angle of a regular polygon is  $178.5^\circ$ .

Calculate the number of sides of this polygon.

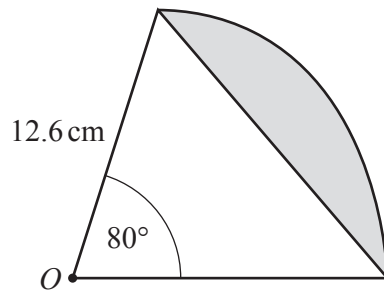
..... [2]

- 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  
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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  $3 \text{ km}^2$ .  
On a map the area of the lake is  $18.75 \text{ cm}^2$ .

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

1 : ..... [3]



- 21 Simplify fully.

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

..... [2]

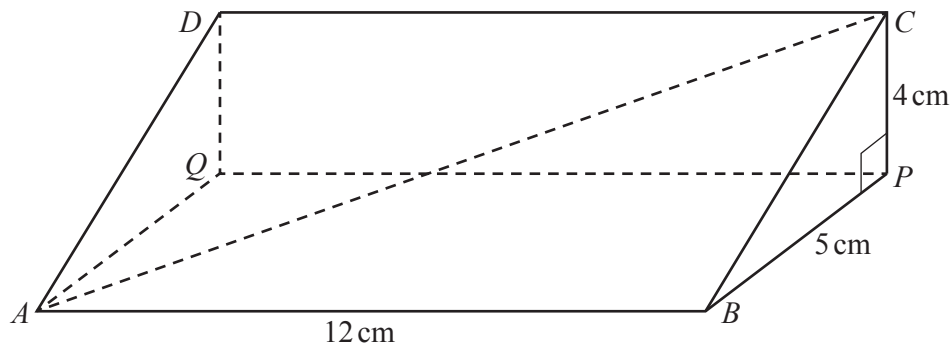
- 22 Solve the simultaneous equations.  
You must show all your working.

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

$$y = x - 1$$

$$x = \dots\dots\dots, y = \dots\dots\dots$$

$$x = \dots\dots\dots, y = \dots\dots\dots [5]$$



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The diagram shows a triangular prism.  
Angle  $BPC = 90^\circ$ .

(a) Calculate  $AC$ .

$AC = \dots\dots\dots$  cm [3]

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

$\dots\dots\dots$  [3]

24  $\tan x = \sqrt{3}$  and  $0^\circ \leq x \leq 360^\circ$ .

Find all the possible values of  $x$ .

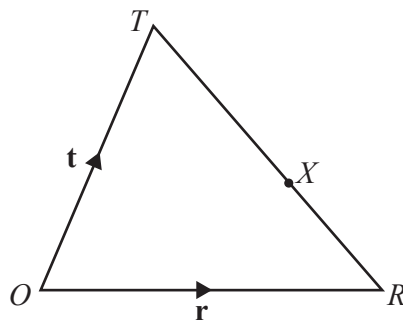
$\dots\dots\dots$  [2]

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,  $\vec{OR} = \mathbf{r}$  and  $\vec{OT} = \mathbf{t}$ .

Find the position vector of  $X$ .

Give your answer in terms of  $\mathbf{r}$  and  $\mathbf{t}$  in its simplest form.

..... [3]

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