



# Cambridge IGCSE™ (9–1)

CANDIDATE  
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NUMBER

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**MATHEMATICS**

**0980/22**

Paper 2 (Extended)

**May/June 2020**

**1 hour 30 minutes**

You must answer on the question paper.

You will need: Geometrical instruments

## INSTRUCTIONS

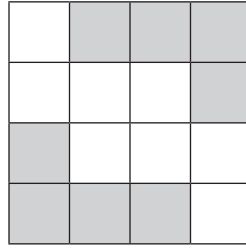
- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction 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 down the order of rotational symmetry of the diagram.

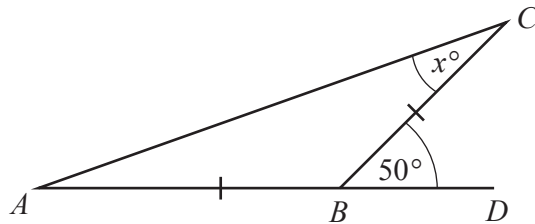
..... [1]

2 At noon the temperature in Maseru was  $21^{\circ}\text{C}$ .  
At midnight the temperature had fallen by  $26^{\circ}\text{C}$ .

Work out the temperature at midnight.

.....  $^{\circ}\text{C}$  [1]

3



NOT TO  
SCALE

$AB = BC$  and  $ABD$  is a straight line.

Find the value of  $x$ .

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

4 Write down

(a) a square number greater than 10,

..... [1]

(b) an irrational number.

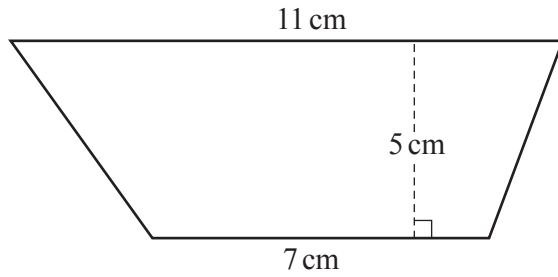
..... [1]

5  $y = mx + c$

Find the value of  $y$  when  $m = -3$ ,  $x = -2$  and  $c = -8$ .

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

6

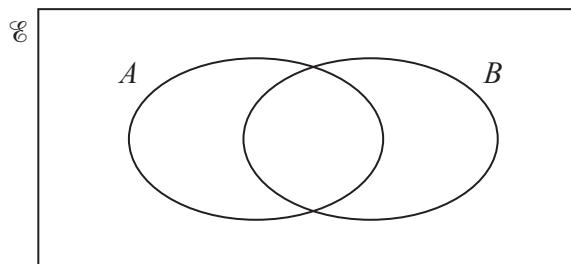


NOT TO SCALE

Calculate the area of the trapezium.

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

7

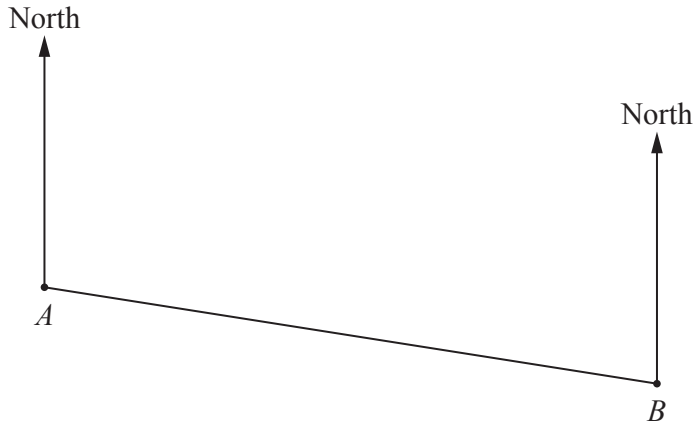


On the Venn diagram, shade the region  $A \cap B$ . [1]

8 Write  $2^{-4}$  as a decimal.

$\dots\dots\dots$  [1]

9

NOT TO  
SCALE

The bearing of  $B$  from  $A$  is  $105^\circ$ .

Find the bearing of  $A$  from  $B$ .

..... [2]

10 Simplify.

$$\frac{p}{2q} \times \frac{4pq}{t}$$

..... [2]

11 **Without using a calculator**, work out  $1\frac{3}{4} - \frac{11}{12}$ .

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

..... [3]

- 12 Roberto buys a toy for \$5.00 .  
He then sells it for \$4.60 .

Calculate his percentage loss.

..... % [2]

- 13 Simplify  $8t^8 \div 4t^4$ .

..... [2]

- 14 Solve the equation.

$$\frac{1-x}{3} = 5$$

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

- 15 Ella's height is 175 cm, correct to the nearest 5 cm.

Write down the upper bound of Ella's height.

..... cm [1]

- 16 Calculate  $(3 \times 10^{-3})^3$ .  
Give your answer in standard form.

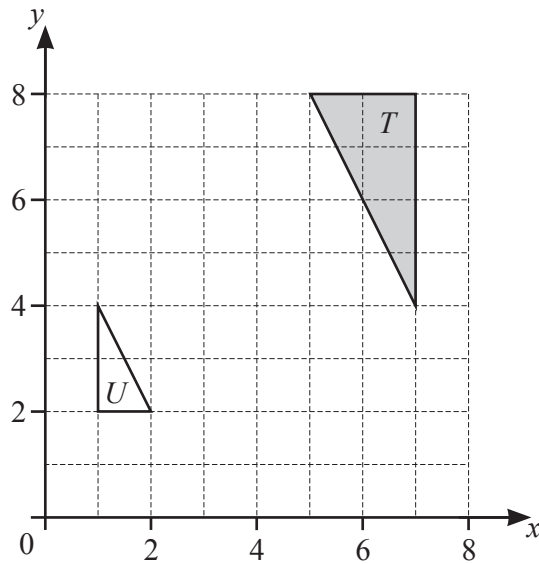
..... [1]

17 A train of length 105 m takes 11 seconds to pass completely through a station of length 225 m.

Calculate the speed of the train in km/h.

..... km/h [3]

18



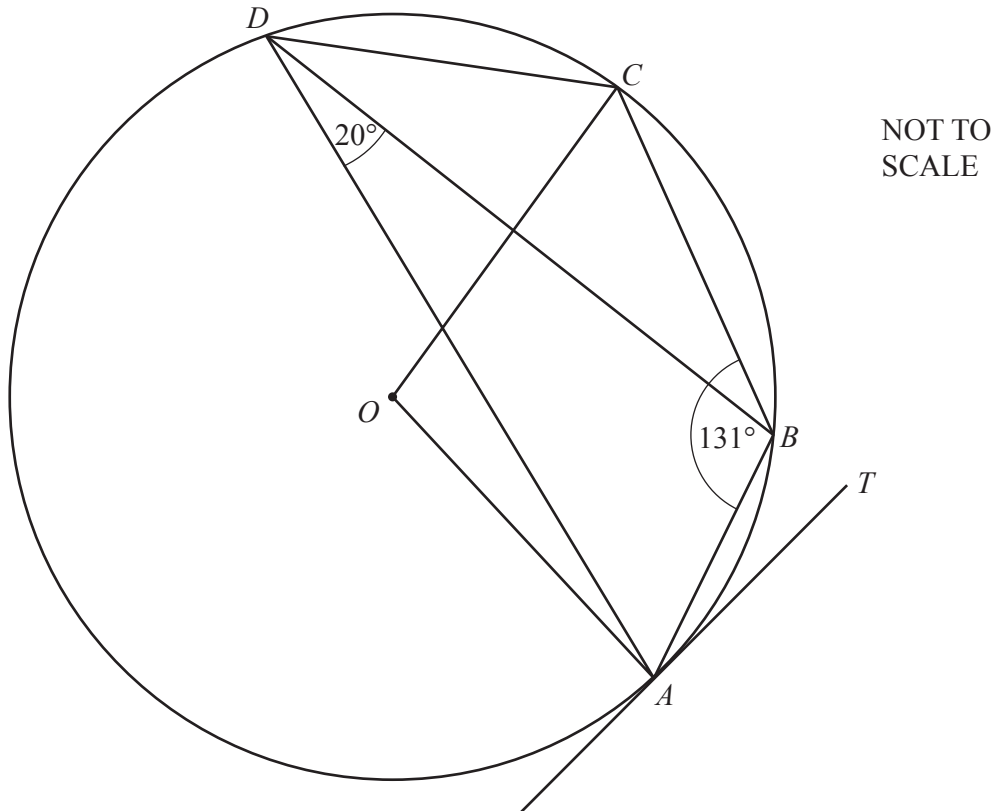
Describe fully the **single** transformation that maps triangle *T* onto triangle *U*.

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

19 Make *y* the subject of the formula.

$$h^2 = x^2 + 2y^2$$

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



$A, B, C$  and  $D$  lie on the circle, centre  $O$ .  
 $TA$  is a tangent to the circle at  $A$ .  
 Angle  $ABC = 131^\circ$  and angle  $ADB = 20^\circ$ .

Find

(a) angle  $ADC$ ,

Angle  $ADC = \dots\dots\dots$  [1]

(b) angle  $AOC$ ,

Angle  $AOC = \dots\dots\dots$  [1]

(c) angle  $BAT$ ,

Angle  $BAT = \dots\dots\dots$  [1]

(d) angle  $OAB$ .

Angle  $OAB = \dots\dots\dots$  [1]

21 Simplify.

(a)  $(5x^4)^3$

..... [2]

(b)  $(256x^{256})^{\frac{3}{8}}$

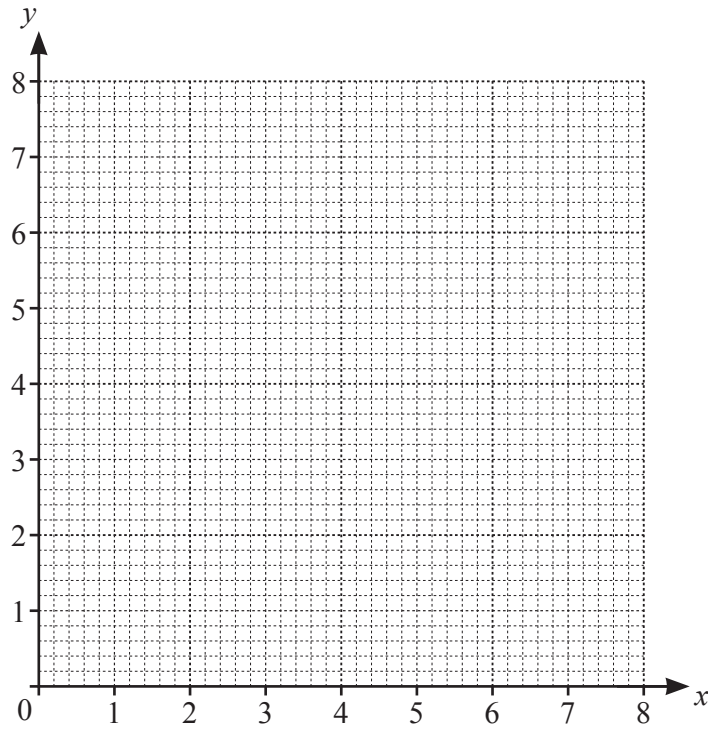
..... [2]

22  $p$  is directly proportional to  $(q+2)^2$ .  
When  $q = 1$ ,  $p = 1$ .

Find  $p$  when  $q = 10$ .

$p =$  ..... [3]



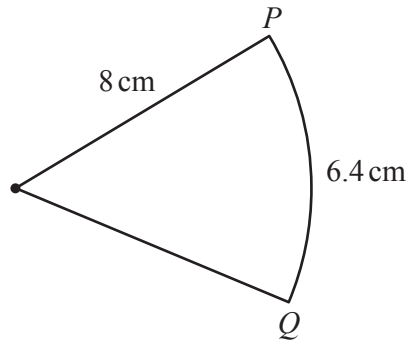


(a) By drawing suitable lines and shading unwanted regions, find the region,  $R$ , where

$$x \geq 2, \quad y \geq x \quad \text{and} \quad 2x + y \leq 8. \quad [5]$$

(b) Find the largest value of  $x + y$  in the region  $R$ .

..... [1]



NOT TO SCALE

The diagram shows a sector of a circle of radius 8 cm.  
The length of the arc  $PQ$  is 6.4 cm.

Find the area of the sector.

.....  $\text{cm}^2$  [4]

25 Simplify.

$$\frac{2x^2 + x - 15}{ax + 3a - 2bx - 6b}$$

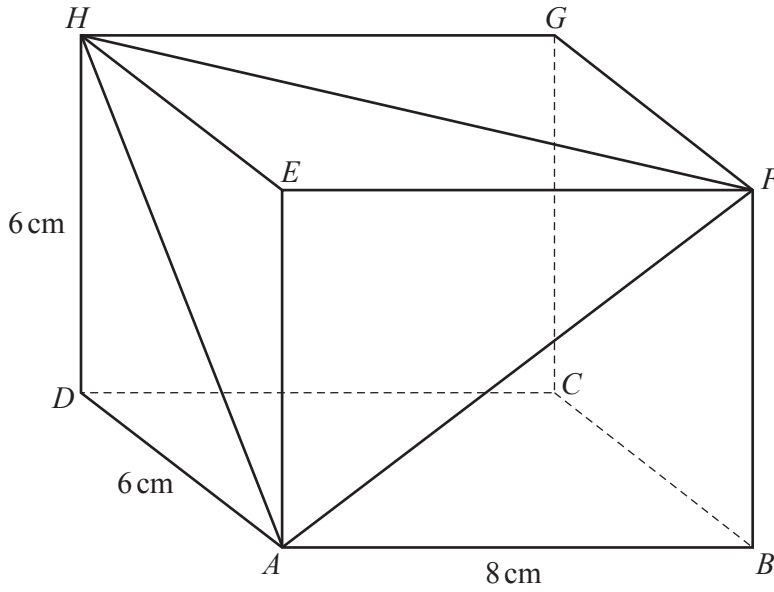
..... [5]

26  $\sqrt[3]{y^2} = \sqrt[n]{x}$  and  $y = \sqrt[n]{x}$ .

Find the value of  $n$ .

$n =$  ..... [2]

**Question 27 is printed on the next page.**



NOT TO SCALE

The diagram shows a cuboid.  
 $AB = 8\text{ cm}$ ,  $AD = 6\text{ cm}$  and  $DH = 6\text{ cm}$ .

Calculate angle  $HAF$ .

Angle  $HAF = \dots\dots\dots [6]$

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