Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

4890138067

MATHEMATICS **0580/22**

Paper 2 (Extended) **February/March 2022**

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. Any blank pages are indicated.

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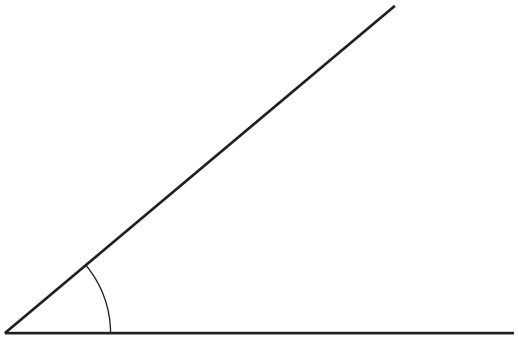
1



Measure the marked angle.

..... [1]

2 Work out $\sqrt{5} \times 6^2$.
Give your answer correct to 2 decimal places.

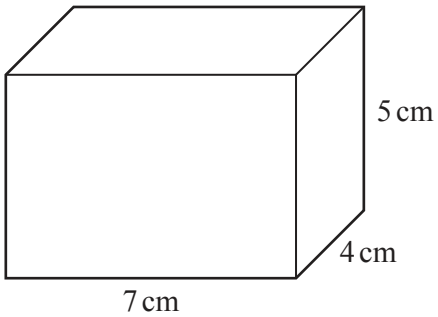
..... [2]

3 A journey starts at 21 15 one day and ends at 04 33 the next day.

Calculate the time taken, in hours and minutes.

..... h ..... min [1]

4



NOT TO SCALE

Calculate the **total** surface area of this cuboid.

..... cm^2 [3]

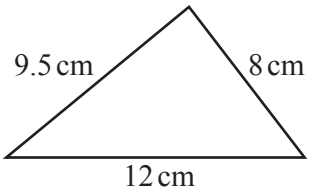
5 **(a)** Write down the gradient of the line $y = 5x + 7$.

..... [1]

(b) Find the coordinates of the point where the line $y = 5x + 7$ crosses the y-axis.

(..... , ...) [1]

6

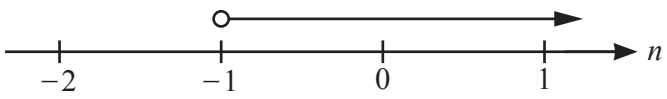


NOT TO SCALE

Using a ruler and compasses only, construct this triangle.
Leave in your construction arcs.
The side of length 12 cm has been drawn for you.

[2]

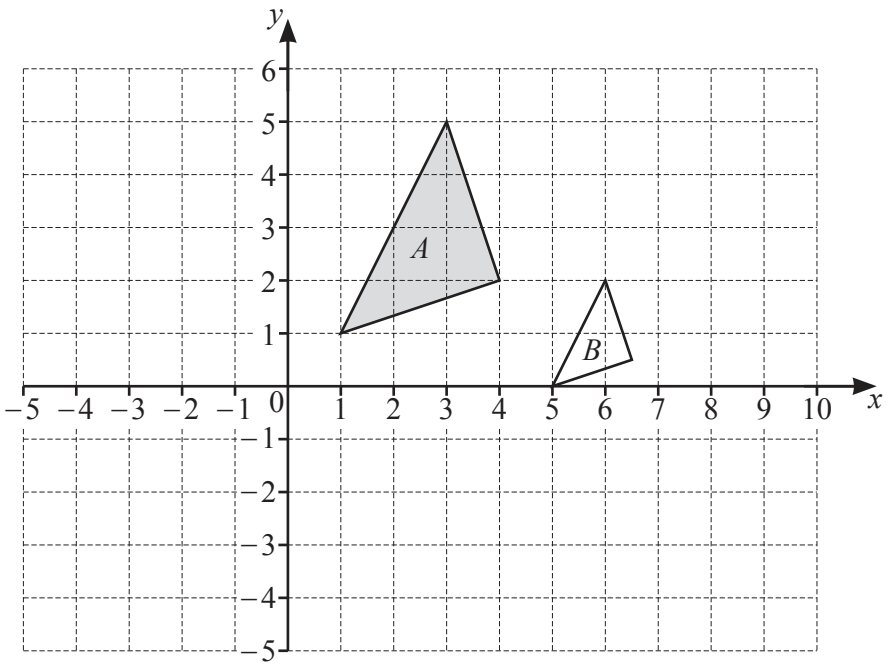
7



Write down the inequality, in terms of n, shown by the number line.

..... [1]

8



(a) On the grid, draw the image of

(i) triangle A after a reflection in the y-axis, [1]

(ii) triangle A after a translation by the vector $\begin{pmatrix}-3\\-4\end{pmatrix}$. [2]

(b) Describe fully the **single** transformation that maps triangle A onto triangle B.

.....

..... [3]

9 Factorise completely.

$$12a^3 - 21a$$

..... [2]

10 **(a)** The nth term of a sequence is $n^2 + 7$.

Find the first three terms of this sequence.

....., ..., ... [2]

(b) These are the first four terms of a different sequence.

15 7 − 1 −9

Find the nth term of this sequence.

..... [2]

11 As the temperature increases, people eat more ice cream.

What type of correlation does this statement describe?

..... [1]

12 **(a)** Sanjay invests \$700 in an account paying simple interest at a rate of 2.5% per year.

Calculate the value of his investment at the end of 6 years.

\$ ..... [3]

(b) Meera invests \$700 in an account paying compound interest at a rate of r% per year.
At the end of 17 years the value of her investment is \$1030.35 .

Find the value of r.

$r =$ ..... [3]

[Turn over

13 **(a)** Simplify $h^2 \times h^5$.

..... [1]

(b) Simplify $\left(\frac{7}{x}\right)^{-3}$.

..... [1]

(c) $a^8 \div a^p = a^2$

Find the value of p.

$p =$ ..... [1]

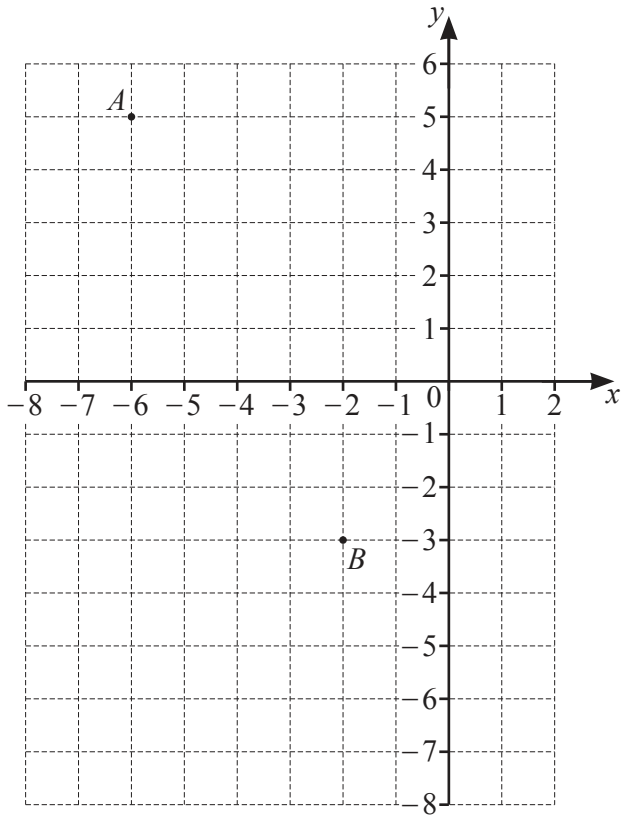
14 Calculate the circumference of a circle with radius 4.7 cm.

..... cm [2]

15 **Without using a calculator**, work out $2\frac{1}{3} \times \frac{11}{14}$.
You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

16



A is the point $(-6, 5)$ and B is the point $(-2, -3)$.

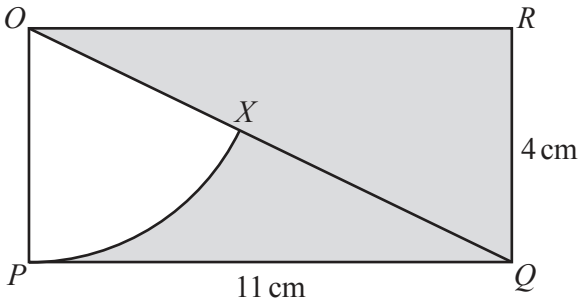
(a) Find the equation of the straight line, l, that passes through point A and point B.
Give your answer in the form $y = mx + c$.

$y =$ ..... [2]

(b) Find the equation of the line that is perpendicular to l and passes through the origin.

..... [2]

17



NOT TO SCALE

The diagram shows a rectangle $OPQR$ with length 11 cm and width 4 cm.
OQ is a diagonal and OPX is a sector of a circle, centre O.

Calculate the percentage of the rectangle that is shaded.

..... % [5]

18 Mrs Kohli buys a jacket, 2 shirts and a hat.
The jacket costs $\$x$.
The shirts each cost \$24 less than the jacket and the hat costs \$16 less than the jacket.
Mrs Kohli spends exactly \$100.

Write down an equation in terms of x.
Solve this equation to find the cost of the jacket.

\$ ..... [3]

19 y is inversely proportional to the square root of $(x+4)$.
When $x = 5$, $y = 2$.

Find y when $x = 77$.

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

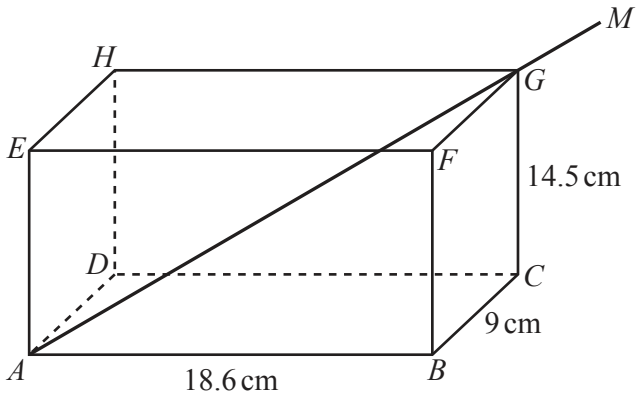
20 Solve the simultaneous equations.
You must show all your working.

$$3x + y = 11$$
$$x^2 - 2y = 18$$

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

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

21



NOT TO SCALE

The diagram shows an open rectangular box *ABCDEFGH*.
AB = 18.6 cm, *BC* = 9 cm and *CG* = 14.5 cm.
A straight stick *AGM* rests against *A* and *G* and extends outside the box to *M*.

(a) Calculate the angle between the stick and the base of the box.

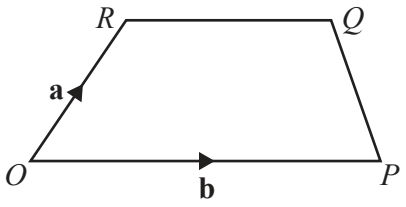
..... [4]

(b) *AM* = 30 cm.

Show that *GM* = 4.8 cm, correct to 1 decimal place.

[3]

22



NOT TO SCALE

The diagram shows a trapezium $OPQR$.
O is the origin, $\overrightarrow{OR} = \mathbf{a}$ and $\overrightarrow{OP} = \mathbf{b}$.

$|\overrightarrow{RQ}| = \frac{3}{5}|\overrightarrow{OP}|$

(a) Find $\overrightarrow{PQ}$ in terms of **a** and **b** in its simplest form.

$\overrightarrow{PQ} =$ ..... [2]

(b) When PQ and OR are extended, they intersect at W.

Find the position vector of W.

..... [2]

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