Cambridge Assessment International Education

# Cambridge IGCSE™

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*4899013806 7*

**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 $\pi$, 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. Any blank pages are indicated.

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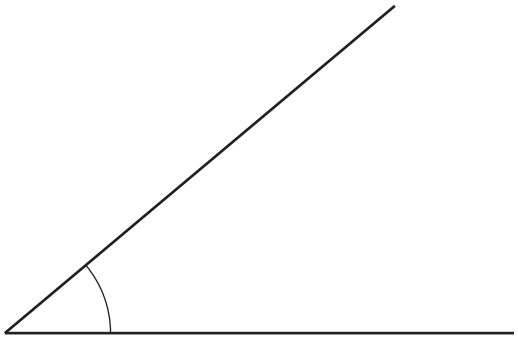
**1**



Measure the marked angle.

..... [1]

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

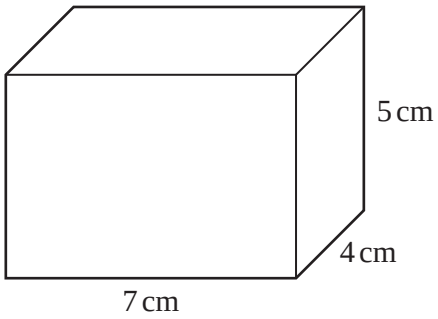
..... [2]

**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]

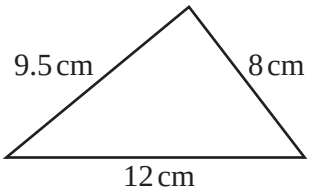
**5** **(a)** Write down the gradient of the line $y = 5x + 7$.

..... [1]

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

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

**6**

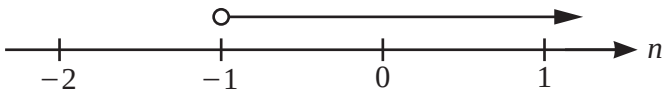



NOT TO SCALE

**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]

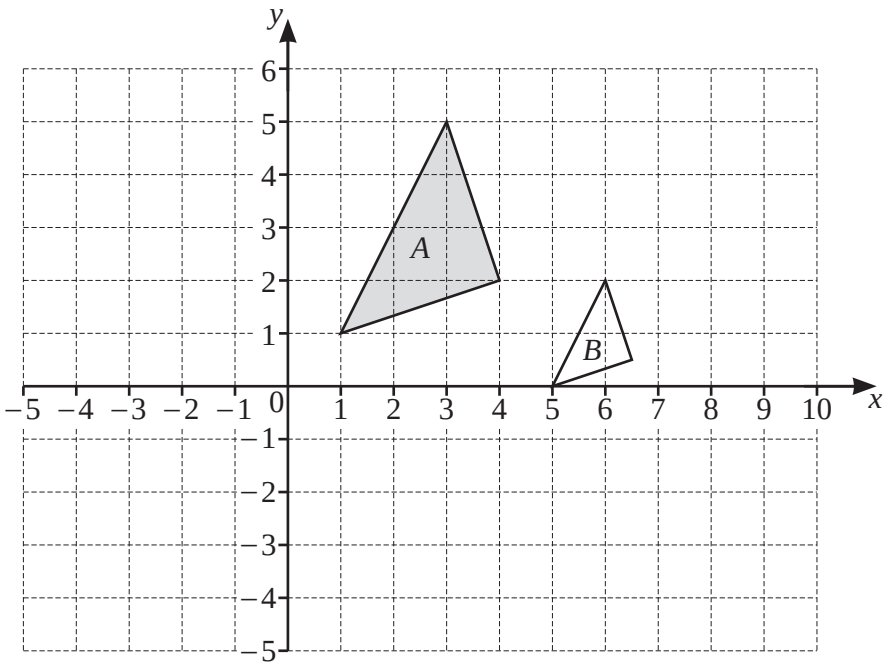
**7**




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 $n$th 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 $n$th 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]

**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]

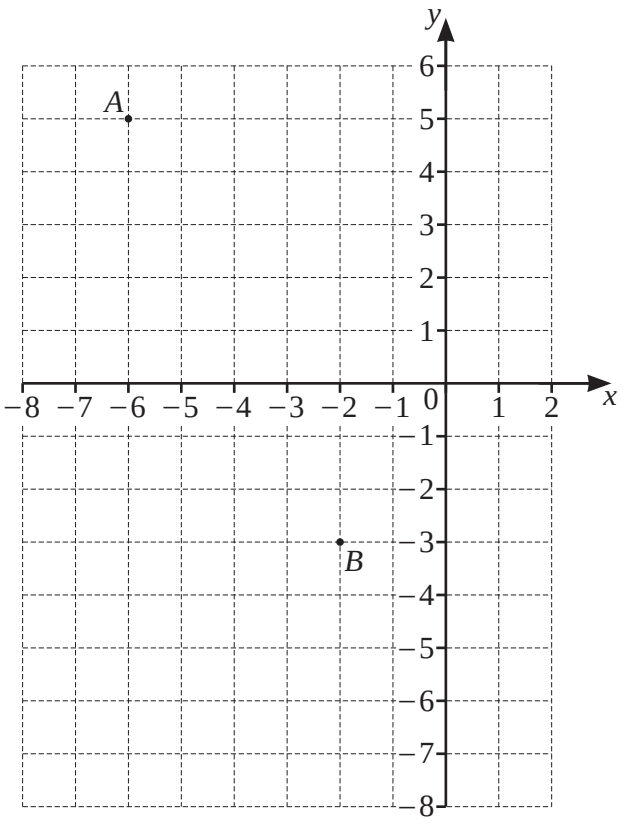
**14** Calculate the circumference of a circle with radius 4.7 cm.

..... 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 $(-2, -3)$.

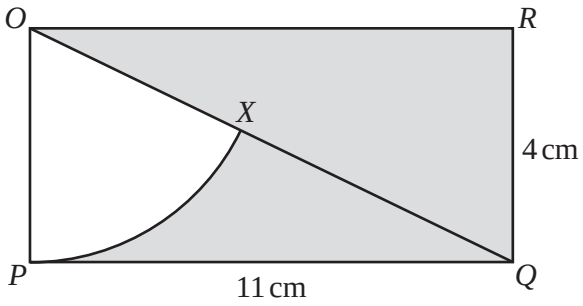
**(a)** Find the equation of the straight line, $l$, that passes through point $A$ and point $B$.
Give your answer in the form $y = mx + c$.

$y =$ ..... [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]

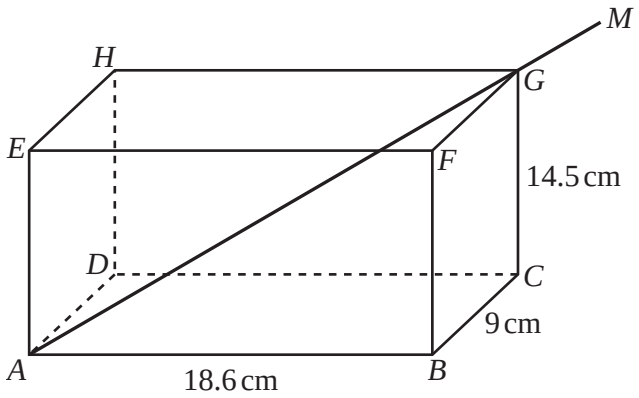
**20** Solve the simultaneous equations.
You must show all your working.

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

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

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

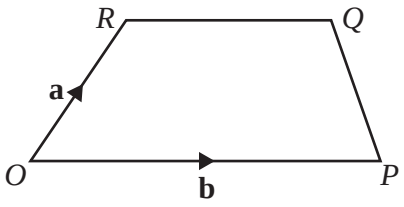
..... [4]

**(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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