Cambridge Assessment International Education

# Cambridge IGCSE™

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**MATHEMATICS** **0580/41**

Paper 4 Calculator (Extended) **May/June 2025**

**2 hours**

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 scientific 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 100.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages.

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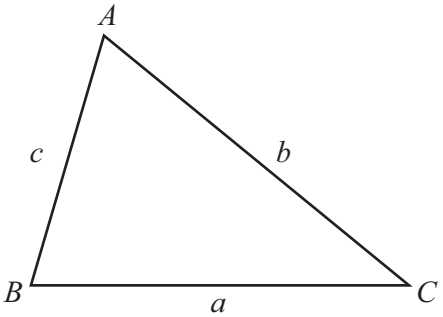
## List of formulas

| | |
|---|---|
| Area, $A$, of triangle, base $b$, height $h$. | $A = \frac{1}{2}bh$ |
| Area, $A$, of circle of radius $r$. | $A = \pi r^2$ |
| Circumference, $C$, of circle of radius $r$. | $C = 2\pi r$ |
| Curved surface area, $A$, of cylinder of radius $r$, height $h$. | $A = 2\pi rh$ |
| Curved surface area, $A$, of cone of radius $r$, sloping edge $l$. | $A = \pi rl$ |
| Surface area, $A$, of sphere of radius $r$. | $A = 4\pi r^2$ |
| Volume, $V$, of prism, cross-sectional area $A$, length $l$. | $V = Al$ |
| Volume, $V$, of pyramid, base area $A$, height $h$. | $V = \frac{1}{3}Ah$ |
| Volume, $V$, of cylinder of radius $r$, height $h$. | $V = \pi r^2 h$ |
| Volume, $V$, of cone of radius $r$, height $h$. | $V = \frac{1}{3}\pi r^2 h$ |
| Volume, $V$, of sphere of radius $r$. | $V = \frac{4}{3}\pi r^3$ |
| For the equation $ax^2 + bx + c = 0$, where $a \neq 0$, | $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ |

For the triangle shown,




$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc\cos A$$

$$\text{Area} = \frac{1}{2}ab\sin C$$

**1** Solve.

View solution

$4c - 9 = 13$

$c =$ ..... [2]

**2** Work out.

View solution

$$\frac{16.71 + 46.13}{\sqrt{8.6^2 - 3.5^2}}$$

Give your answer correct to 2 significant figures.

..... [2]

**3** In the USA, one gallon of fuel costs \$4.83 .
In the UK, one litre of fuel costs £1.62 .

View solution

The exchange rate is £1 = \$1.215 .
1 gallon = 3.785 litres

In which country does 1 litre of fuel cost more and by how much?
Give your answer in dollars.

..... by \$ ..... [3]

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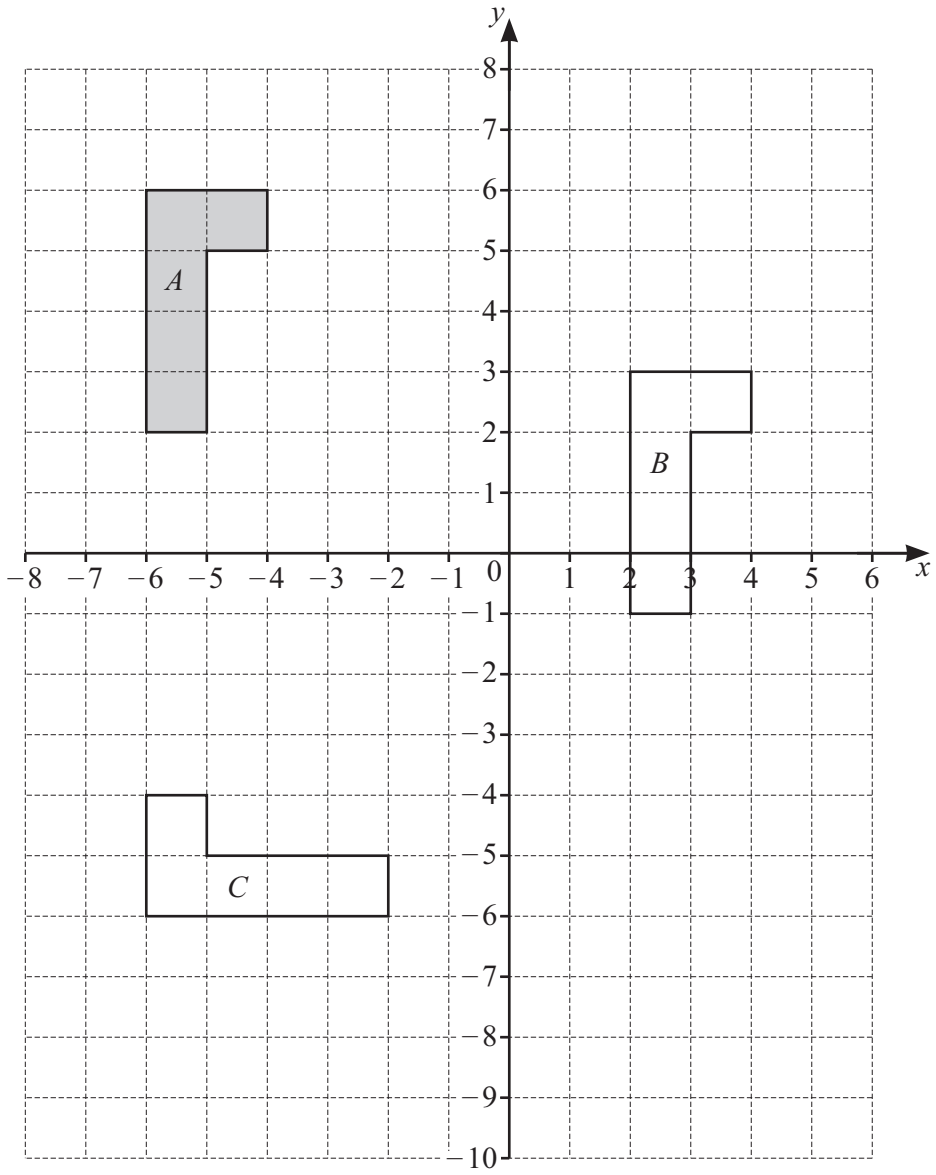
**4**




**(a)** Describe fully the **single** transformation that maps

**(i)** shape $A$ onto shape $B$

.....

..... [2]

View solution

**(ii)** shape $A$ onto shape $C$.

.....

..... [3]

View solution

**(b)** On the grid, draw the image of shape $A$ after a reflection in the line $x = -2$. [2]

View solution

**5** **(a)** These are the first 5 terms of a sequence.

View solution

1 8 27 64 125

Find the 10th term of this sequence.

..... [1]

**(b)** These are the first 5 terms of a different sequence.

View solution

5 8 13 20 29

Find the *n*th term of this sequence.

..... [2]

**(c)** The **sum of the first *n* terms** of another sequence is $\frac{n}{2}(5n-1)$.

View solution

**(i)** Use $n = 2$ to find the sum of the first two terms in this sequence.

..... [1]

**(ii)** Find the 3rd term of this sequence.

View solution

..... [2]

**6** Expand.

View solution

$5x^2(3x-2)$

..... [2]

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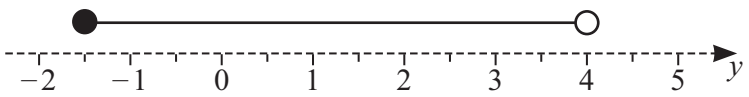
**7**




View solution

Write down the inequality in $y$ shown by the number line.

..... [2]

**8** Hadi buys a dishwasher.
He can either pay a single payment of \$980 or he can pay using a monthly plan.
The monthly plan is 20% of \$980 **plus** 12 payments of \$75.25 .

View solution

**(a)** Hadi uses the monthly plan.

Calculate the total amount Hadi pays.

\$ ..... [2]

**(b)** Find the percentage increase in the cost using the monthly plan compared to a single payment.

View solution

..... % [2]

**9** In a sale, the original price of a sewing machine is reduced by \$38.
This is an 8% reduction in the original price.

View solution

Work out the original price of the sewing machine.

\$ ..... [2]

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**10** **(a)** Write down **all** the factors of 18.

View solution

..... [2]

**(b)** Factorise.

$$3y - xy + 15 - 5x$$

View solution

..... [2]

**(c)** $3y - xy + 15 - 5x = 18$

View solution

where $x$ and $y$ are positive integers.

Using your answers to **part (a)** and **part (b)**, find one possible value of $x$ and the corresponding value of $y$.

$x =$ ..... , $y =$ ..... [2]

**11** A warehouse has a floor area of 800 $m^2$.
The plan of the warehouse is drawn to a scale of 1 : 50.

View solution

Calculate the floor area on the plan.
Give your answer in square centimetres.

..... $cm^2$ [3]

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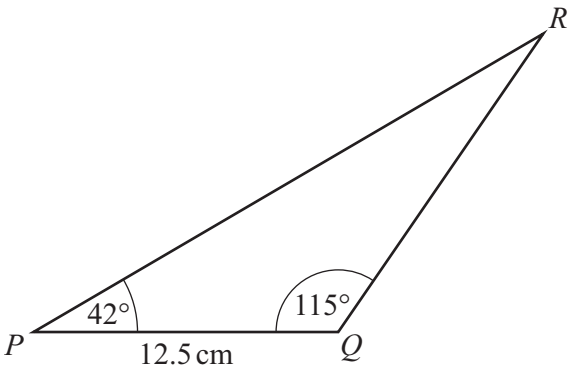
**12**

View solution




NOT TO SCALE

The diagram shows triangle $PQR$.

Calculate the shortest distance from $Q$ to $PR$.

..... cm [3]

**13** Make $x$ the subject of this formula.

View solution

$$A = w^2 + 5x^2$$

$x =$ ..... [3]

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**14** The table shows some values for $y = 5x^2 - x^3 - 4$ .

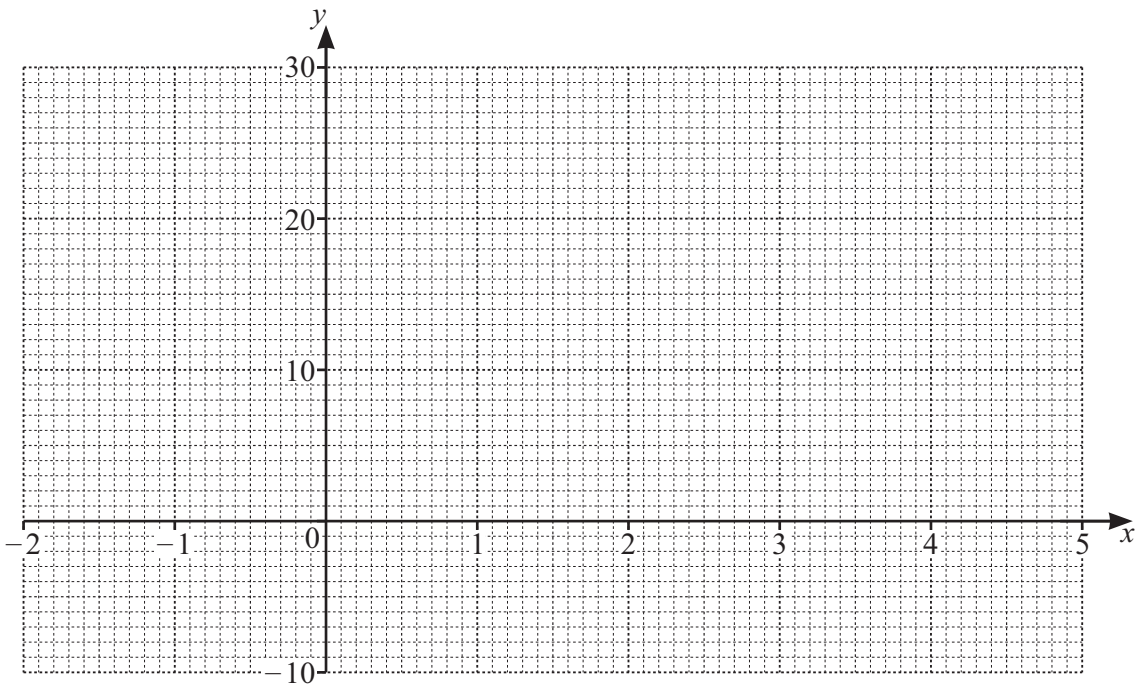
| $x$ | $-2$ | $-1$ | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| $y$ | 24 | | $-4$ | | 8 | 14 | | $-4$ |

View solution

**(a)** Complete the table. [3]

View solution

**(b)** On the grid, draw the graph of $y = 5x^2 - x^3 - 4$ for $-2 \leqslant x \leqslant 5$.




[4]

View solution

**(c)** By drawing a suitable straight line on the grid, solve the equation $x^3 - 5x^2 - x + 14 = 0$.

$x =$ ..... or $x =$ ..... or $x =$ ..... [4]

**15** The height of each of 140 basketball players is recorded.
The table shows the results.

| Height ($h$ cm) | $160 < h \leqslant 180$ | $180 < h \leqslant 185$ | $185 < h \leqslant 190$ | $190 < h \leqslant 200$ | $200 < h \leqslant 210$ |
|---|---|---|---|---|---|
| Frequency | 7 | 12 | 31 | 70 | 20 |

**(a)** Calculate an estimate of the mean height.

View solution

..... cm [4]

**(b)** Two of the players are chosen at random.

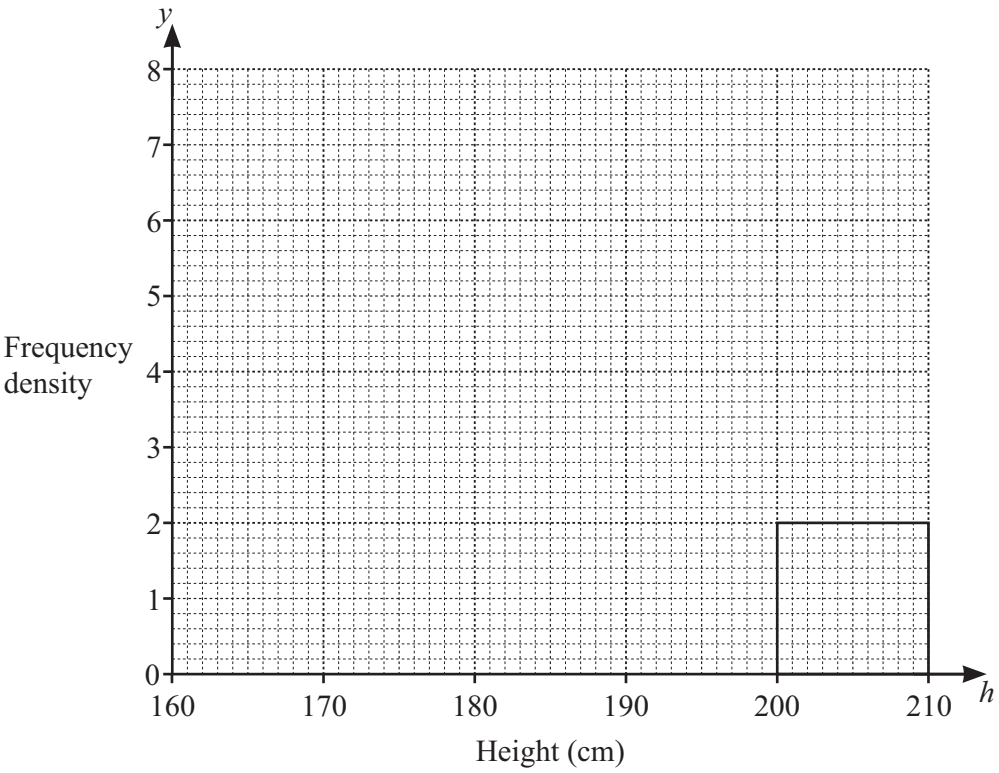
Find the probability that both players have a height greater than 190 cm and no more than 200 cm.

View solution

..... [2]

**(c)** Complete the histogram to show the information in the frequency table.

View solution




[3]

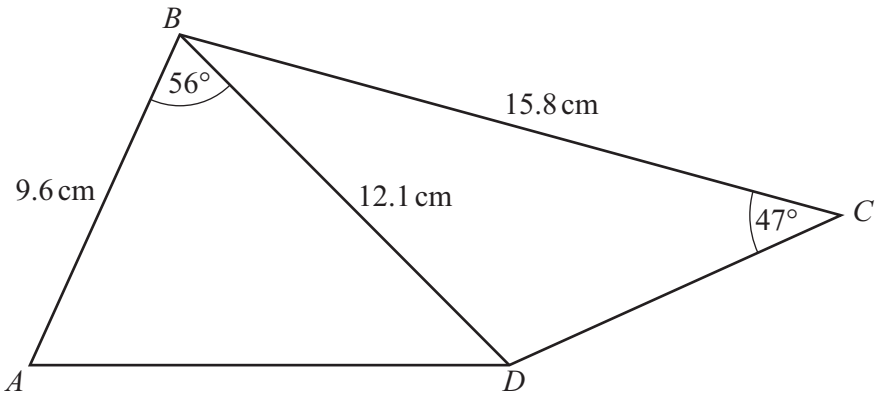
View solution

**16** Mateo invests \$1250 at a rate of $r$% per year compound interest.
At the end of 6 years the total value of his investment is \$1484.

Calculate the value of $r$.

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

**17**




NOT TO SCALE

The diagram shows a quadrilateral *ABCD*.

**(a)** Calculate *AD*.

View solution

*AD* = ..... cm [3]

**(b)** Calculate the obtuse angle *BDC*.

View solution

Angle *BDC* = ..... [4]

**(c)** Calculate the area of the quadrilateral.

View solution

..... $cm^2$ [3]

**18** $2x^2 + 12x - 2$ can be written in the form $a(x+b)^2 - c$.

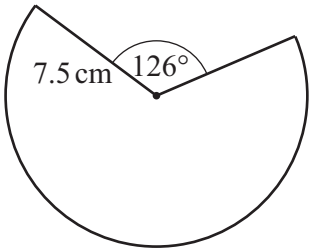
View solution

Find the values of $a$, $b$ and $c$.

$a =$ ..... , $b =$ ..... , $c =$ ..... [3]

**19**

View solution



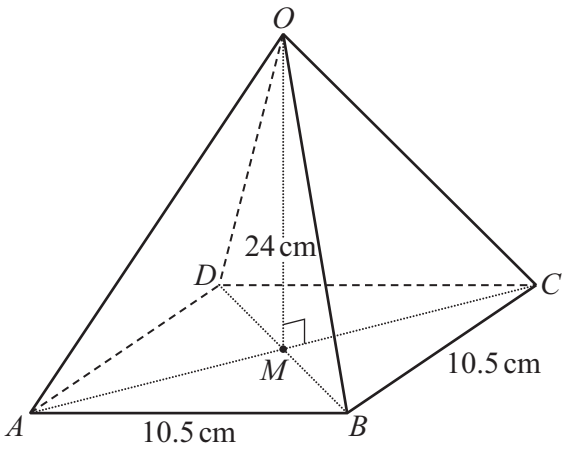

NOT TO SCALE

The diagram shows a major sector of a circle with radius 7.5 cm.

Calculate the perimeter of the major sector.

..... cm [4]

**20**




NOT TO SCALE

The diagram shows a pyramid $OABCD$.
The pyramid has a square base, $ABCD$, with sides 10.5 cm.
The vertex $O$ is vertically above the centre of the base, $M$.
The height of the pyramid is 24 cm.

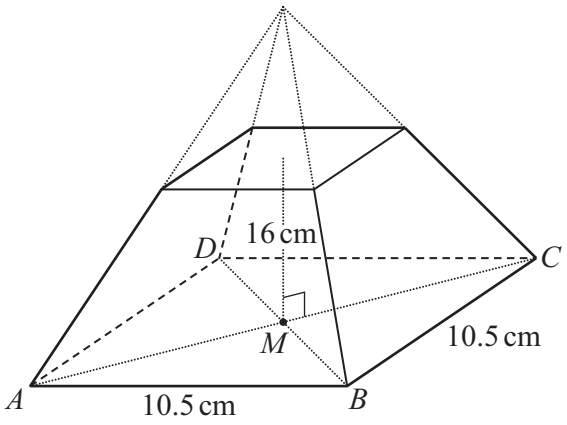
**(a)** Calculate the angle that $OA$ makes with the base.

View solution

..... [4]

**(b)**

View solution




NOT TO SCALE

The diagram shows a frustum of the pyramid *OABCD*.
The height of the frustum is 16 cm.

Calculate the volume of the frustum.

..... $cm^3$ [5]

**Question 21 is on page 16.**

**21** $\dfrac{16^{5m}}{4} = 64^{2n}$

View solution

Find $m$ in terms of $n$.

$m =$ ..... [3]

**22** $I = \dfrac{V}{R}$

View solution

$V$ is 50, correct to the nearest 10.
$R$ is 13, correct to the nearest integer.

Calculate the upper bound of $I$.

..... [3]

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