Cambridge Assessment International Education

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MATHEMATICS **0580/42**

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 π, 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 **20** pages. Any blank pages are indicated.

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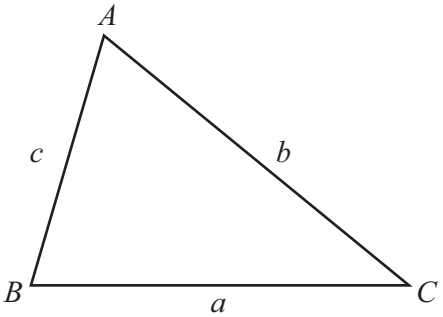
List of formulas

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 A quadrilateral has these properties

View solution

- the diagonals are the only lines of symmetry
- it has rotational symmetry of order 2.

Write down the mathematical name of this quadrilateral.

..... [1]

2

View solution



The diagram shows the net of a solid.

Write down the mathematical name of this solid.

..... [1]

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3 Mass of box A : Mass of box B = 4 : 7

View solution

The mass of box B is 2.4 kg more than the mass of box A.

Calculate the mass of box A and the mass of box B.

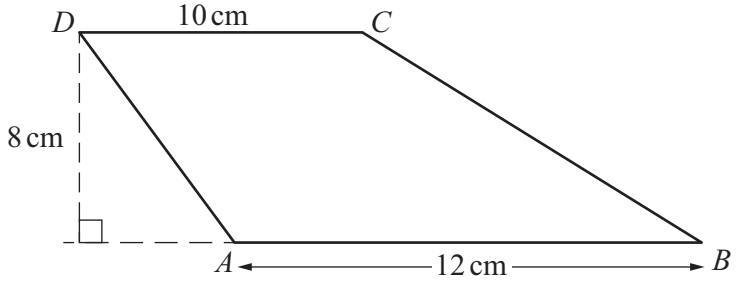
box A ..... kg

box B ..... kg

[3]

View solution

4



NOT TO SCALE

$ABCD$ is a trapezium.

Work out the area of the trapezium.

..... cm^2 [2]

View solution

5 Scott changes \$300 into pounds (£).
The exchange rate is £1 = \$1.20 .

Calculate the amount Scott receives.

..... pounds [1]

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6 A solid wooden cone has base radius 4 cm and height 12 cm.
The density of the wood is 0.74 g/cm^3.

View solution

Calculate the mass of the cone.
[Density = Mass ÷ Volume]

..... g [3]

7 $y = mx + c$

View solution

Rearrange the formula to make m the subject.

$m =$ ..... [2]

8 Calculate.

View solution

$$\frac{2.1^2 - 1.9}{0.5}$$

..... [1]

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

View solution

$$2w - 3y = 11$$
$$3w + y = 11$$

$w =$ .....

$y =$ .....

[3]

10 A group of 12 adults and 9 children travel on a bus.

View solution

The cost of an adult ticket is $\$n$.
The cost of a child ticket is $\$(n - 10)$.

The total cost of the tickets is \$277.50 .

Find the cost of one adult ticket.

\$ ..... [3]

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11 In a sale, the original price of a shirt is reduced by 15%.
The sale price of the shirt is $23.63 .

View solution

Find the original price of the shirt.

$ ..... [2]

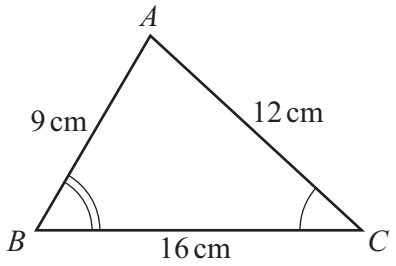
12 The length of a rectangle is 16 cm, correct to the nearest centimetre.
The width of the rectangle is 14 cm, correct to the nearest centimetre.

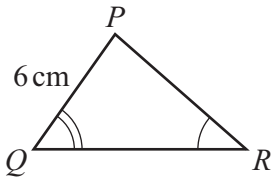
View solution

Calculate the lower bound of the perimeter of the rectangle.

..... cm [2]

13





NOT TO SCALE

Triangle ABC and triangle PQR are mathematically similar.

(a) Calculate the length of PR.

View solution

$PR =$ .....cm [2]

(b) Triangle ABC and triangle PQR are the cross-sections of two prisms.
These prisms are mathematically similar.
The volume of the smaller prism is $1120\,\text{cm}^3$.

View solution

Calculate the volume of the larger prism.

..... cm^3 [2]

14 Factorise.

$$5x - 10 - ax + 2a$$

View solution

..... [2]

15 The interior angle of a regular polygon is 172°.

Find the number of sides of this polygon.

View solution

..... [2]

16 On any day, the probability that the weather will be sunny is 0.7 .

(a) Find the probability that on any day the weather will not be sunny.

View solution

..... [1]

(b) When the weather is sunny, the probability that Rohit goes for a walk is 0.9 .
When the weather is not sunny, the probability that Rohit goes for a walk is 0.2 .

Find the probability that on any day Rohit goes for a walk.

View solution

..... [3]

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17 **(a)** Alex invests \$400 at a rate of 2.3% per year simple interest.

View solution

Find the total amount Alex has at the end of 5 years.

\$ ..... [3]

(b) Virat has \$100 to spend.

View solution

In February he spends \$$x$.
In March he spends 10% more than he spends in February.
In April he spends 10% more than he spends in March.

At the end of April, Virat has \$33.80 remaining.

Find the value of x.

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

(c) Bobbie invests $500 in an account that pays compound interest each year.
At the end of 17 years, the value of Bobbie's investment is $700.13 .

View solution

Find the value of Bobbie's investment at the end of 20 years.

$ ..... [4]

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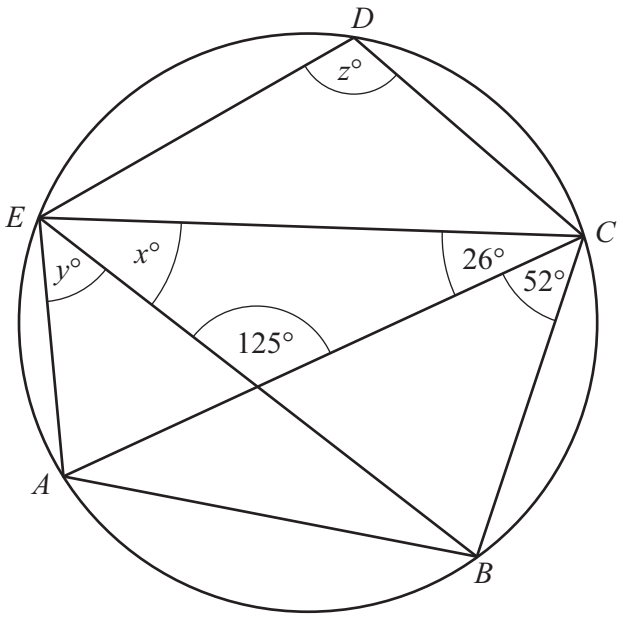
18

View solution



NOT TO SCALE

A, B, C, D and E lie on a circle.

Find the values of x, y and z.

$x =$ .....

$y =$ .....

$z =$ .....

[4]

19 $f(x) = x + 1$ $g(x) = 5 - 2x$ $h(x) = 2^x$

(a) Find $f(-3)$.

View solution

..... [1]

(b) The domain of $g(x)$ is $\{-3, 0, 2\}$.

Find the range of $g(x)$.

View solution

{ ..... } [2]

(c) Find x when $h(x) = \frac{1}{32}$.

View solution

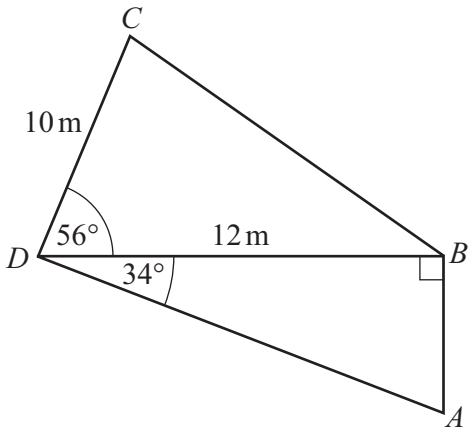
$x =$ ..... [1]

(d) Find x when $h^{-1}(x) = 3$.

View solution

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

20



NOT TO SCALE

The diagram shows a quadrilateral $ABCD$.
$CD = 10$ m and $DB = 12$ m.
Angle $DBA = 90°$, angle $CDB = 56°$ and angle $ADB = 34°$.

(a) Calculate the length of AB.

View solution

$AB =$ ..... m [2]

(b) Calculate the area of the quadrilateral $ABCD$.

View solution

..... m^2 [3]

(c) Calculate the perimeter of the quadrilateral $ABCD$.

View solution

..... m [5]

(d) Calculate the shortest distance from B to the line AD.

View solution

..... m [3]

21 Simplify.

(a) $3t^5 \times 5t^3$

View solution

..... [2]

(b) $\left(64u^{36}\right)^{\frac{5}{6}}$

View solution

..... [2]

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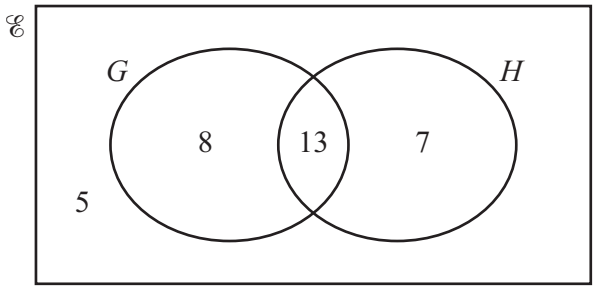
22



$\mathscr{E}$ = {number of students in a class}
G = {number of students who study geography}
H = {number of students who study history}

The Venn diagram shows information about the 33 students in a class.

View solution

(a) One of the students in the class is picked at random.

Find the probability that this student

(i) does not study geography and does not study history

..... [1]

(ii) studies geography and studies history.

View solution

..... [1]

(b) Two of the students who study history are picked at random.

View solution

Find the probability that one student also studies geography and one student does not study geography.

..... [3]

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23 Simplify.

$$\frac{h^2+4h}{h^2-16}$$

View solution

..... [3]

24 Ahmed walks 2 km at a speed of x km/h.
He then walks a further 3 km at a speed of $(x+1)$ km/h.

The total time he takes to walk the 5 km is $1\frac{1}{4}$ hours.

(a) Show that $5x^2-15x-8=0$.

View solution

[5]

(b) Find the value of x.
Show all your working and give your answer correct to 2 decimal places.

View solution

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

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25 P is the point $(8, 0)$ and Q is the point $(20, 6)$.

View solution

Find the equation of the perpendicular bisector of PQ.
Give your answer in the form $y = mx + c$.

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

26 $y = ax^{11} + 3x^b$

View solution

$$\frac{dy}{dx} = 44x^{10} + 18x^c$$

Find the values of a, b and c.

$a =$ .....

$b =$ .....

$c =$ .....

[2]

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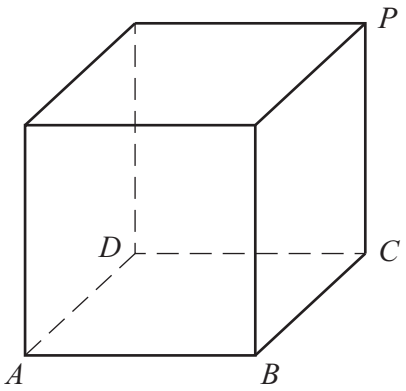
27

View solution



NOT TO SCALE

The diagram shows a cube.

Calculate the angle between the diagonal AP and the base $ABCD$.

..... [4]

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