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WJEC GCSE Mathematics and Numeracy (Double Award) – Question Pack

Calculator-allowed perimeter, area and volume problems: rectangles, triangles, circles, composite shapes and prisms.
Confident use of π and decimal

REVISE

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F3.03 – Perimeter, area & volume – calculator problems

Spec 3.6.1, 3.6.3, 1.9.6 – Unit 3 (calculator allowed)

Calculator-allowed perimeter, area and volume problems: rectangles, triangles, circles, composite shapes and prisms. Confident use of π and decimal multiplication is expected. Sourced from legacy WJEC GCSE Mathematics-Numeracy Foundation papers (3300U10/U20) and accessible content from Intermediate papers (3300U30/U40), organised for revision under the 2025 spec.

2025 SPECIFICATION

Estimated time for entire question pack: ~48 minutes

Derived from the GCSE Higher pace of ~1.5 min/mark (32 marks across 9 questions).

*You are advised to **not** attempt to complete all of this in one sitting.*

ABOUT THIS QUESTION PACK

This is a **focused single-topic practice pack**, not a single mock paper. Questions are organised against the 2025 specification. Questions are ordered chronologically by sitting, with custom-written and SAM questions at the end.

INSTRUCTIONS

Use black ink or black ball-point pen. Show all working – method marks are awarded for clear setup.

A calculator is allowed on every question in this pack (Unit 3 is the calculator-allowed paper).

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Perimeter, area & volume – calculator problems – what the new spec asks

WJEC GCSE Mathematics (first teaching 2025) · Unit 3: calculator-allowed.

Perimeter and area 3.5.1

- Find perimeter of rectangles, triangles and composite shapes.
- Find area of rectangles, triangles and parallelograms.
- Apply formulae for circle area and circumference.

Volume 3.5.4

- Calculate volume of cuboids and prisms.
- Calculate volume of cylinders.
- Use volume = cross-section \times length.

Units of measure 3.5.6

- Convert between mm, cm, m and km.
- Convert between cm^2/m^2 and cm^3/m^3 .
- Know $1 \text{ cm}^3 = 1 \text{ ml}$ and $1\,000 \text{ cm}^3 = 1 \text{ litre}$.

Exam strategy 3.5

- State the formula used.
- Keep π in working; round only at the end.
- Always include units in the final answer.

Perimeter, area & volume – calculator problems in one page

Quick-reference notes – revisit before each question. Don't use during the questions.

Perimeter

Add up all the outside edges.

For a rectangle: $P = 2(l + w)$.

Area – rectangle & triangle

$$A_{\text{rect}} = l \times w$$

$$A_{\text{tri}} = \frac{1}{2} \times b \times h$$

Triangle height is *perpendicular* to the base.

Area & circumference of a circle

$$C = 2\pi r$$

$$A = \pi r^2$$

Use the π key – don't round to 3.14 unless told.

Composite shapes

Split into rectangles, triangles, semicircles.

Find each part's area, then add (or subtract for holes).

Volume of a prism

$$V = \text{area of cross-section} \times \text{length}$$

Cuboid: $V = l \times w \times h$. Cylinder: $V = \pi r^2 h$.

Units

Length: cm, m. Area: cm^2 , m^2 . Volume: cm^3 , m^3 .

$1 \text{ cm}^3 = 1 \text{ ml}$. $1000 \text{ cm}^3 = 1 \text{ litre}$.

20. $ABCF$ is a rectangle.
 $CDEF$ is a trapezium.
 BD is a straight line.

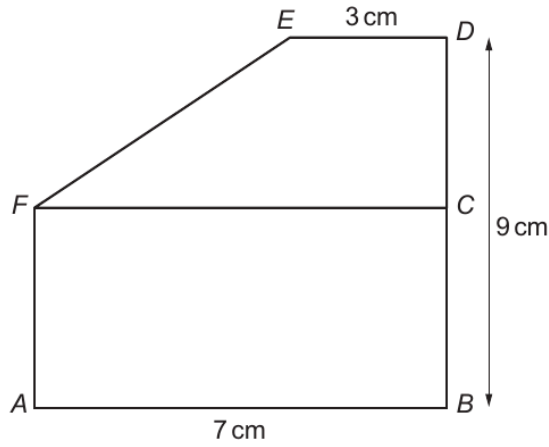


Diagram not drawn to scale

$AB = 7\text{ cm}$, $BD = 9\text{ cm}$ and $DE = 3\text{ cm}$.
The perimeter of rectangle $ABCF$ is 24 cm .
Calculate the **area** of the trapezium $CDEF$.
You must show all your working.

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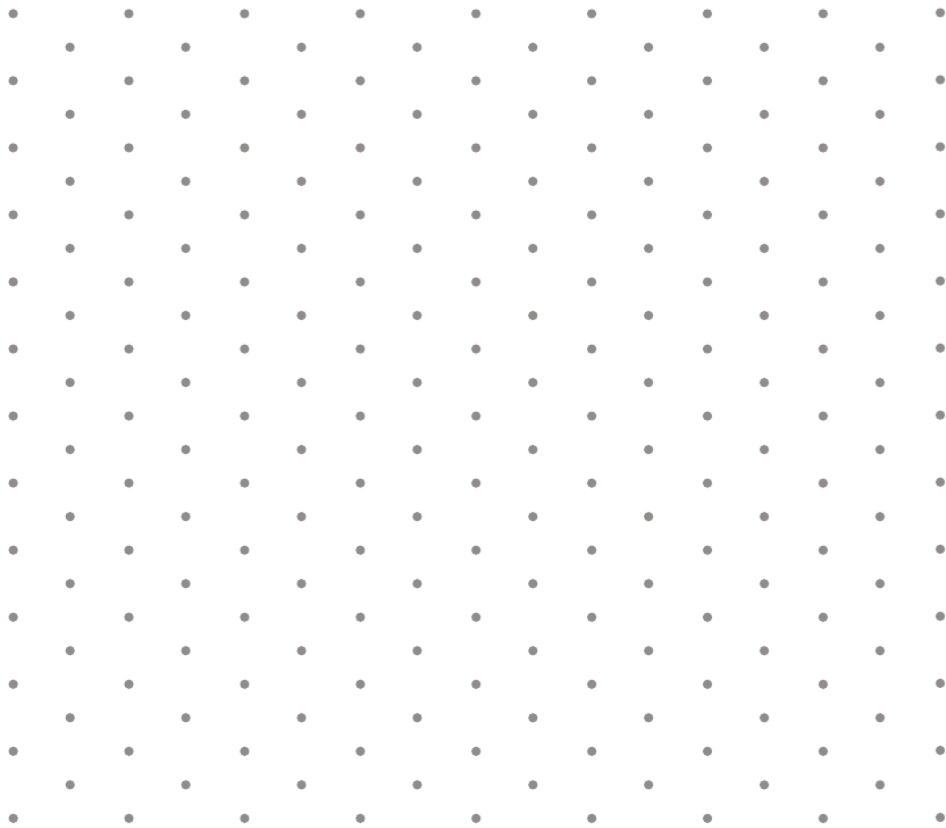
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END OF PAPER



Examiner
only

5. (a) Draw an isometric representation of a cuboid measuring 6 cm by 4 cm by 3 cm. Use the grid below. [2]



- (b) Calculate the volume of the cuboid. Give the units of your answer. [3]

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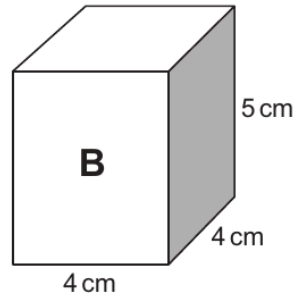
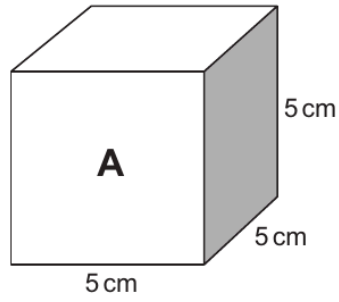
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Examiner
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18. Cube **A** and cuboid **B** are shown below.



Diagrams not drawn to scale

Express the volume of **B** as a percentage of the volume of **A**.
You must show all your working.

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Examiner
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13. The diagram below shows an empty cylinder, with radius 10 cm and height 20 cm.

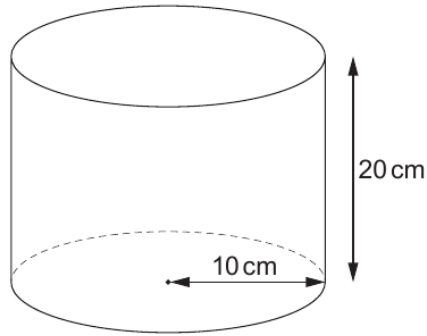


Diagram not drawn to scale

(a) Using $\pi = 3.14$, calculate the volume of the cylinder. [2]

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(b) What is the greatest **whole** number of litres that this cylinder can hold? [1]

..... litres



Examiner
only

17. $ABCE$ is a square.

Calculate the area of the shape $ABCDE$ shown below.

[5]

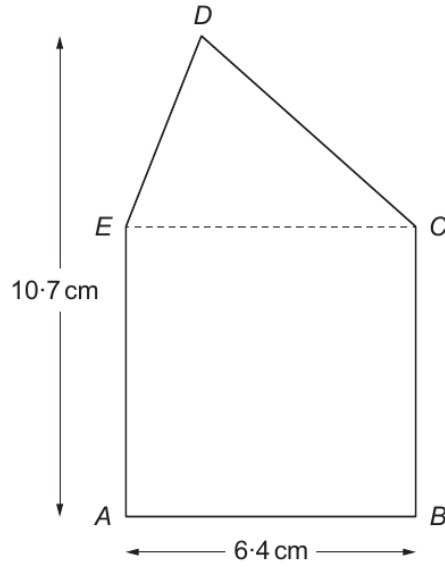


Diagram not drawn to scale

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18. A cuboid has sides x cm, 5 cm and 7 cm.
The total surface area of the cuboid is 142 cm^2 .

Form an equation in terms of x .
Solve the equation to find x .

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Examiner
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END OF PAPER



Examiner
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15. In the diagram below, $ABCE$ is a square and CDE is a right-angled triangle. The length of DE is 4 cm and the area of triangle CDE is 14 cm^2 .

Calculate the area of the **whole shape** $ABCDE$.
You must show all your working.

[4]

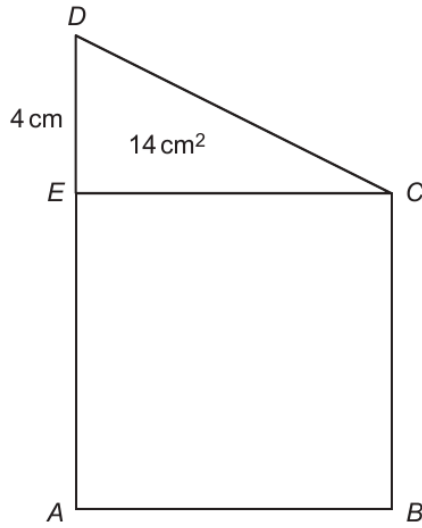


Diagram not drawn to scale

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Examiner
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13. A , B and C are points on the circumference of a circle with centre O .
The length of BC is 10 cm.
The diameter of the circle is 18 cm.

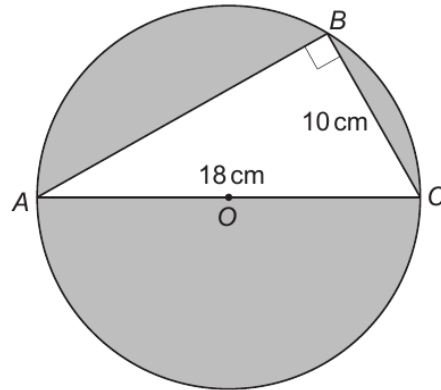


Diagram not drawn to scale

Calculate the shaded area.
You must show all your working.

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Examiner only

8. (a) (i) A single tree can absorb 48 **pounds** of carbon dioxide per year.
 Calculate the carbon dioxide absorbed per year by a forest of 440 of these trees.
 Give your answer in **kilograms**. [2]

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Carbon dioxide absorbed per year is kg

(ii) A forest of trees absorbs 2.3×10^{11} grams of carbon dioxide per year.
 Which of the following is 2.3×10^{11} ? Circle your answer. [1]

230 000 000 000 23 000 000 000 2 300 000 000 000

0.000 000 000 0023 0.000 000 000 023

(b)

Remember: $10\,000\text{ m}^2 \approx 2.47\text{ acres}$
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A report states that a fire in a forest has a high risk of spreading when there are more than 60 trees per acre.

There are 615 trees in Grancwm Forest.
 The forest covers an area of $40\,000\text{ m}^2$.

Would a fire in Grancwm Forest have a high risk of spreading?

Yes No

You must show all your working to support your answer. [4]

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Examiner only

- (c) A vertical pine tree stands on horizontal ground.
 From a point on the ground 21 metres from its base, the angle of elevation of the top of the pine tree is 39° .

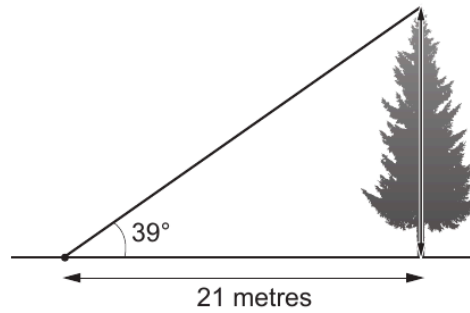


Diagram not drawn to scale

- (i) Show that the pine tree has a vertical height of 17 metres. [3]

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- (ii) A cylindrical log is cut from this pine tree.
 The **circumference** of the cross-section of the log is 1.75 m.
 The length of the log is half the height of the tree.
 Calculate the volume of the log.
 Give your answer in m^3 .
 You must show all your working. [5]

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Volume of the log is m^3

