

Name	Date started	Target end date
------	--------------	-----------------

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

Drawing nets, sketching plans, front and side elevations, and reading 2-D representations of 3-D shapes on isometric paper.
Sourced from legacy WJEC G

REVISE
.wales

3.27 – Plans, elevations & nets

Spec 3.3.5, 3.3.6, 3.3.7 – Unit 3 (calculator allowed)

Drawing nets, sketching plans, front and side elevations, and reading 2-D representations of 3-D shapes on isometric paper. Sourced from legacy WJEC GCSE Mathematics / Mathematics–Numeracy Higher and Intermediate calculator-allowed papers, organised for revision under the 2025 spec.

2025 SPECIFICATION

Estimated time for entire question pack: ~33 minutes

Derived from the GCSE Higher pace of ~1.5 min/mark (22 marks across 7 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).

All question content is © WJEC CBAC Ltd. and reproduced for revision purposes only.

Plans, elevations & nets – what the new spec asks

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

Plans & elevations 3.3.5

- Plan = top-down view (looking down).
- Front elevation = view from the front; side elevation = view from the side.
- Use squared paper and keep the scale consistent across all three views.

Isometric drawing 3.3.6

- Use the triangular dotted grid – vertical edges go up the page.
- Other edges follow the 30° grid lines.
- Hidden edges are dashed; visible edges are solid.

Nets 3.3.7

- A net is the unfolded surface of a solid.
- Different nets of the same solid are possible – check folding.
- Sum of net areas = surface area of the solid.

Coordinated views 3.3.5

- Widths line up between plan and front elevation.
- Heights line up between front and side elevations.
- Use construction lines to keep them aligned.

Plans, elevations & nets in one page

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

Plan view

The *plan* is what you see looking *straight down* from above.

For a cuboid sitting on a table, the plan is the rectangle of its base.

For a stack of cubes, count how many cubes are visible from above in each column.

Front & side elevations

elevation = 2D view from one side

Front elevation = view from the front;
side elevation = view from the side.

Both are flat rectangles for a cuboid, with the height shown vertically.

Three coordinated views

Plan above; front elevation directly below the plan; side elevation to the right of the front.

Widths must match across views.

Heights match between front and side elevations.

Nets

A *net* is the flat shape you would cut out and fold to make the solid.

Cube net: 6 squares (11 distinct arrangements).

Triangular prism net: 2 triangles + 3 rectangles.

Check: would it fold back into a closed solid with no overlaps?

Isometric drawing

An *isometric* drawing shows a 3D solid on a triangular dotted grid.

Vertical edges go up the page; the other edges follow the 30° grid lines.

Lengths along the grid are drawn to scale – one dot per centimetre is typical.

Stacked-cube isometric

For a stack of identical cubes, plan = a square per column with height labelled.

Front elevation: outline of the stack from the front.

Side elevation: outline from the side.

Hidden vs visible edges

In a plan or elevation, only the visible outline is drawn.

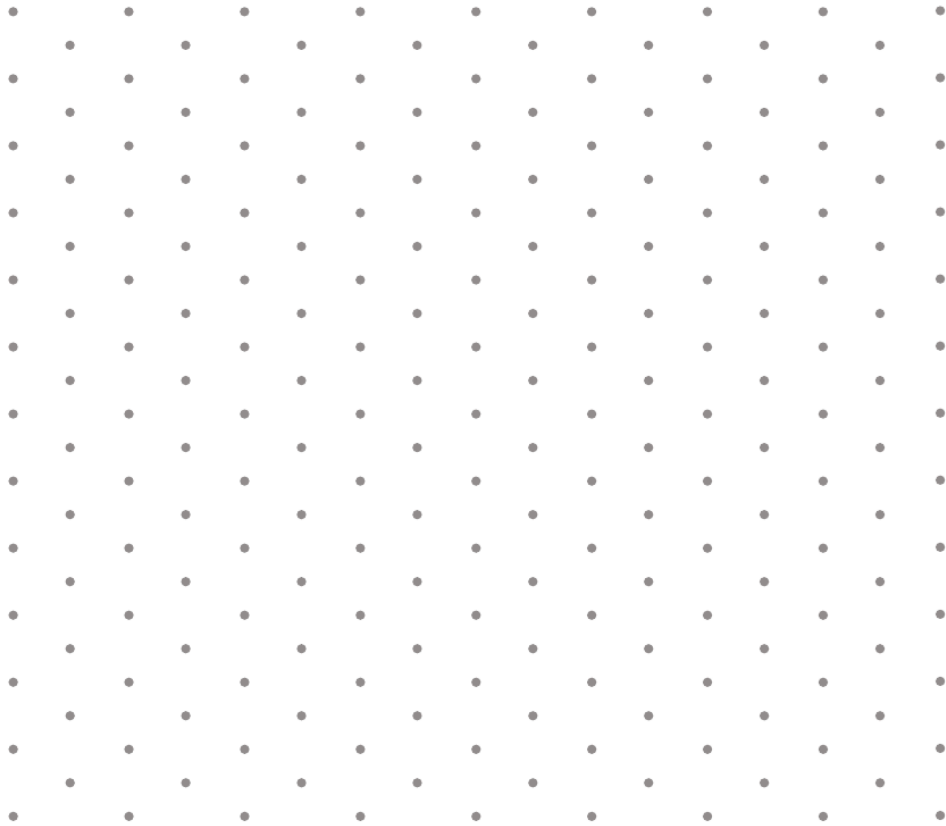
On an isometric drawing, hidden edges are dashed; visible edges are solid lines.

Common traps

- Confusing *plan* (top-down) with *elevation* (side-on).
- Drawing the net with the wrong number of faces.
- Forgetting that hidden edges in an isometric drawing are dashed.
- Plan and elevations not aligning column-by-column on the grid.

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]

.....

.....

.....



Examiner
only

5. The picture shows a mountain hut.
The hut
- stands on a rectangular base,
 - has a uniform cross-section.



(a) Draw a sketch of the plan view of the mountain hut.

[1]

- (b) This mountain hut is shown on a map.
The scale of the map is 1 : 50 000.
On the map the mountain hut is 4.2 cm from a farmhouse.
How far away is the hut from the farmhouse?
Give your answer in km.

[3]

.....

.....

.....

.....

.....

.....

.....

.....

.....

Distance is km



Examiner only

(c) The map below shows the placement of four wind turbines, and a road connecting two of the turbines.



A new wind turbine, Efail, is to be built.

It is to be placed

- on the road connecting Bryn turbine and Cwm turbine, and
- on the perpendicular from Aber turbine to the road.

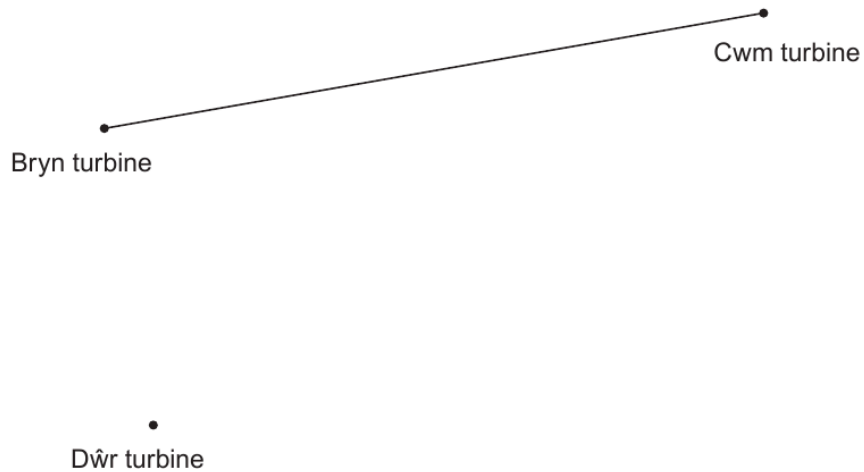
The map is drawn using a scale of **2 cm represents 1 km**.

How far will Efail turbine be from Dŵr turbine?

You **must** use constructions to answer this question, using **only a pair of compasses and a ruler**. [4]

Scale 2 cm represents 1 km

- Aber turbine



.....

.....

Distance is km



Examiner
only

4. A cuboid is to be drawn on the isometric grid below.
Find a possible length, width and height for the cuboid, such that:
- the cuboid has a volume of 12 cm^3
 - each of the length, width and height is a whole number of centimetres.

Write the length, width and height of your cuboid in the spaces below.
Use the grid below to draw an isometric representation of your cuboid.

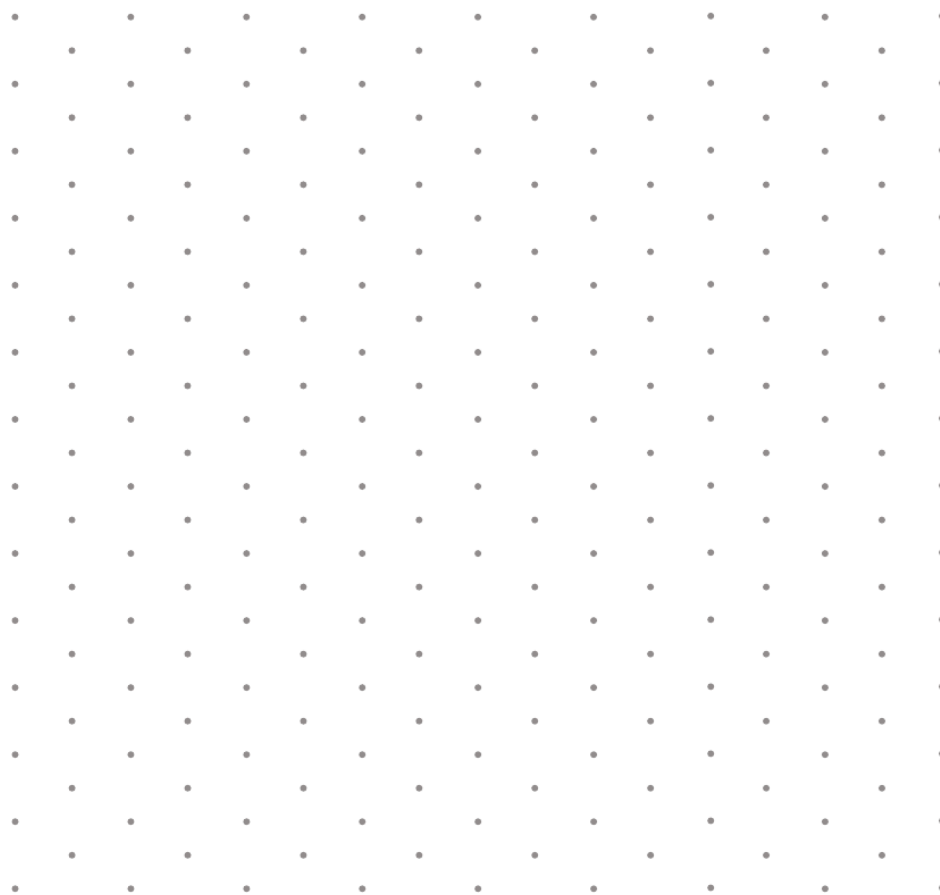
[3]

.....

.....

.....

Length = cm Width = cm Height = cm



3300U301
05



Examiner only

6. Luke wants to lay wooden flooring in the living room of his house. The plan view of his living room floor is shown below.

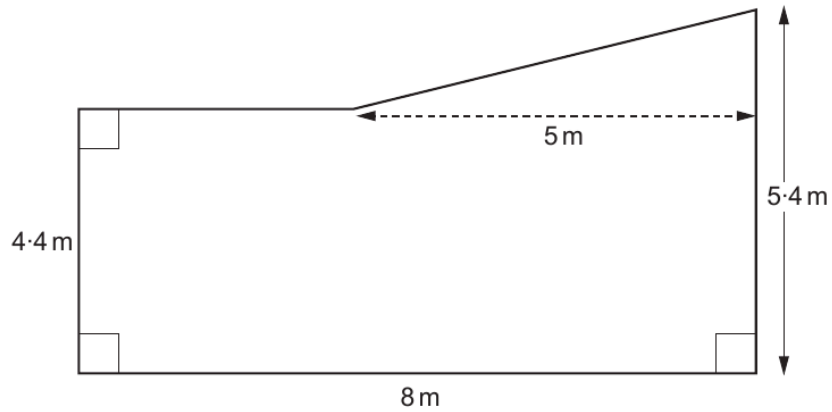


Diagram not drawn to scale

All the measurements shown on the diagram are **correct to the nearest 0.2 m**.

Luke knows that:

- each pack of wooden flooring covers **exactly 3 m^2**
- 10% needs to be added to the area of the floor that is to be covered, to ensure he has enough wooden flooring.

Calculate the minimum number of packs needed to guarantee that Luke has enough wooden flooring to cover his living room floor.

You must show all your working.

[6]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

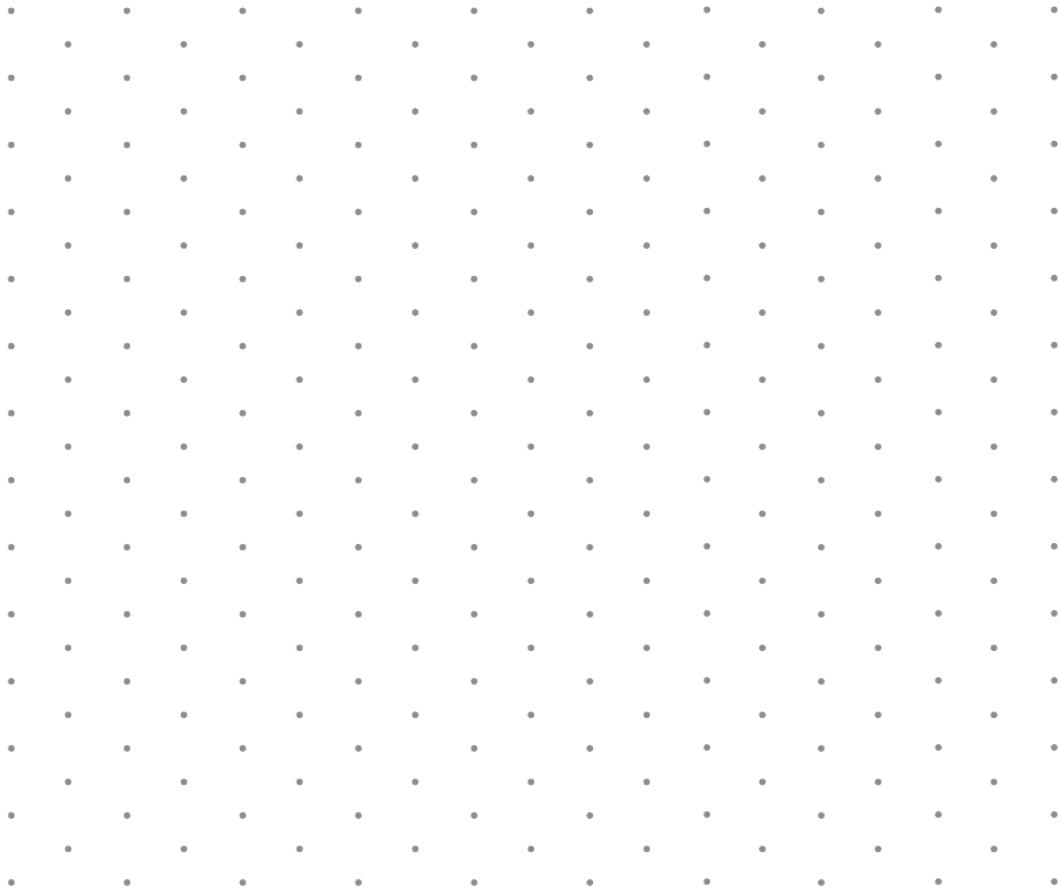
.....

.....



Examiner
only

5. (a) Draw an isometric representation of a cuboid measuring 7 cm by 5 cm by 3 cm. Use the grid below. [2]



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

.....

.....

.....



Examiner only

10. Square-Off is a company that has designed new offices for its workers.

- (a) The main building has a square floor with an area of 500m^2 .
 The reception has a square floor with an area of 80m^2 .
 The triangular region outside the buildings is paved.
 A plan view of the buildings and the paved region is shown below.

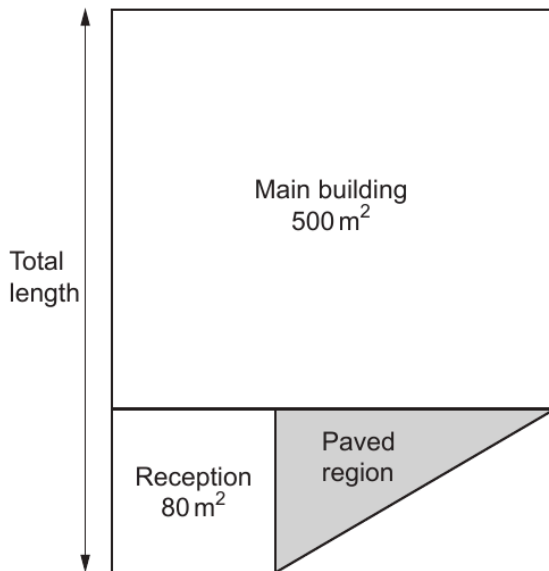


Diagram not drawn to scale

- (i) Calculate the total length of the two buildings.
 Give your answer in the form $a\sqrt{b}$, where a and b are integers and b is a prime number. [3]

.....

.....

.....

.....

- (ii) Calculate the area of the paved region.
 You must show all your working. [2]

.....

.....

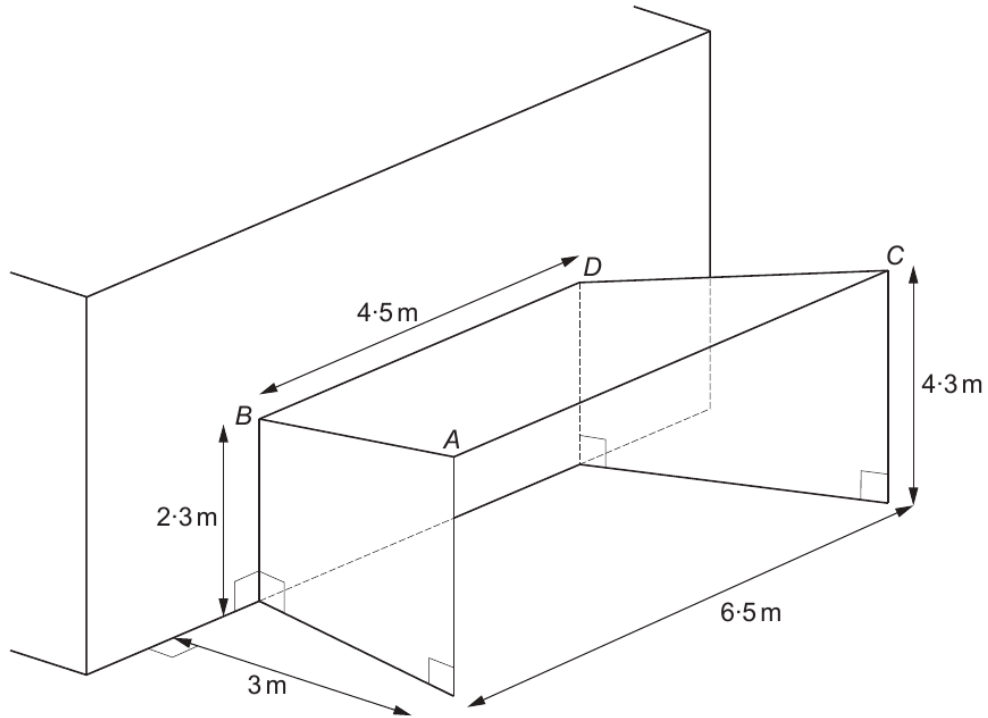
.....

.....

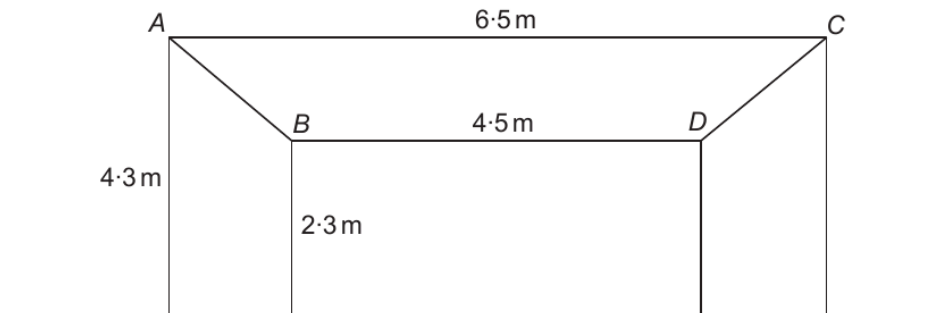


(b) Square-Off has designed an entrance to the reception.

The symmetrical structure is made from 3 connected metal sheets, each in the shape of a trapezium.



FRONT VIEW



Diagrams not drawn to scale



Examiner
only

The 3 metal sheets are connected to each other along the edges AB and CD .
Adhesive strips are needed along the entire length of these edges.

Calculate the length of the adhesive strip AB .
Leave your answer as a surd.

[4]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....



Examiner
only

12. Shipping containers are used to transport goods around the world.
The dimensions of a shipping container are as follows:



- The height is 2.59m, correct to the nearest centimetre.
- The width is 2.43 m, correct to the nearest centimetre.
- The length is approximately double the width.

(a) What is the least possible **width** of this shipping container?
Circle your answer.

[1]

- 2.425 m 2.42 m 2.435 m 2.426 m 2.424 m

.....

.....

(b) An end view of a stack of these shipping containers is shown below.

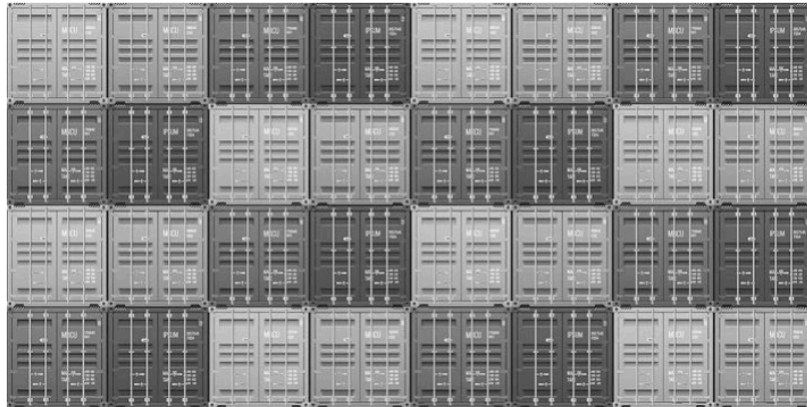


Diagram not drawn to scale

(i) Calculate the greatest possible **height** of the stack of shipping containers.
Give your answer in metres.

[3]

.....

.....

.....

.....

.....

.....



Examiner
only

- (ii) There are 32 shipping containers in this stack.
Sketch the plan view of this stack of shipping containers in the space below. [1]

- (c) In 2012, there were 2×10^7 shipping containers in the world.

Joshua says,

By 2025, I think that the number of shipping containers in the world will reach 1.2×10^8 .

Assuming Joshua is correct, complete the statement below.

"By 2025, the percentage increase in the number of shipping containers in the world since 2012 will be %."

You must show all your working. [3]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

END OF PAPER

