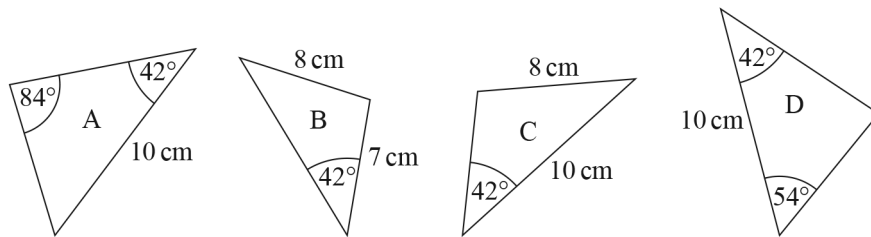


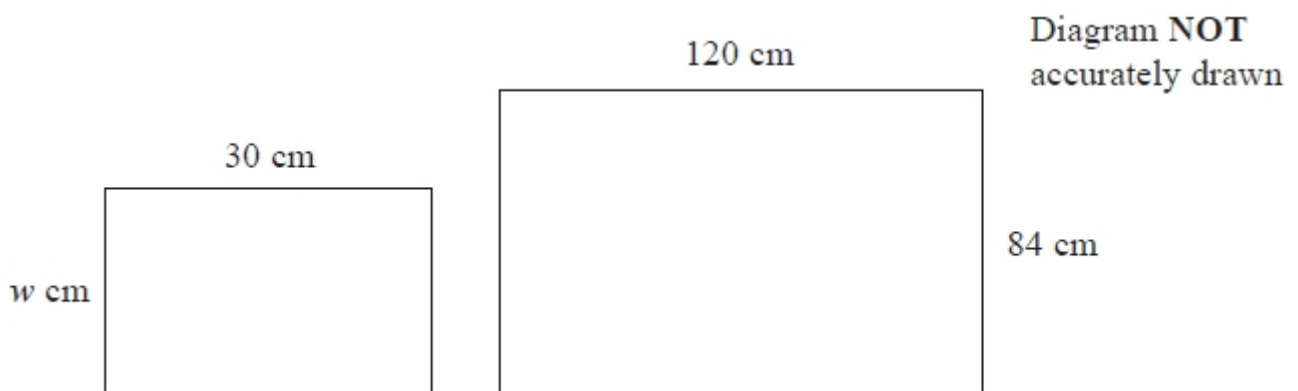
Higher tier unit 12 check in test

Calculator

Q1. Identify the two congruent triangles.



Q2. The diagram shows two rectangles.



The rectangles are similar.
Work out the value of w .

Q3. Quadrilaterals $ABCD$ and $LMNP$ are mathematically similar.

Angle A = angle L

Angle B = angle M

Angle C = angle N

Angle D = angle P

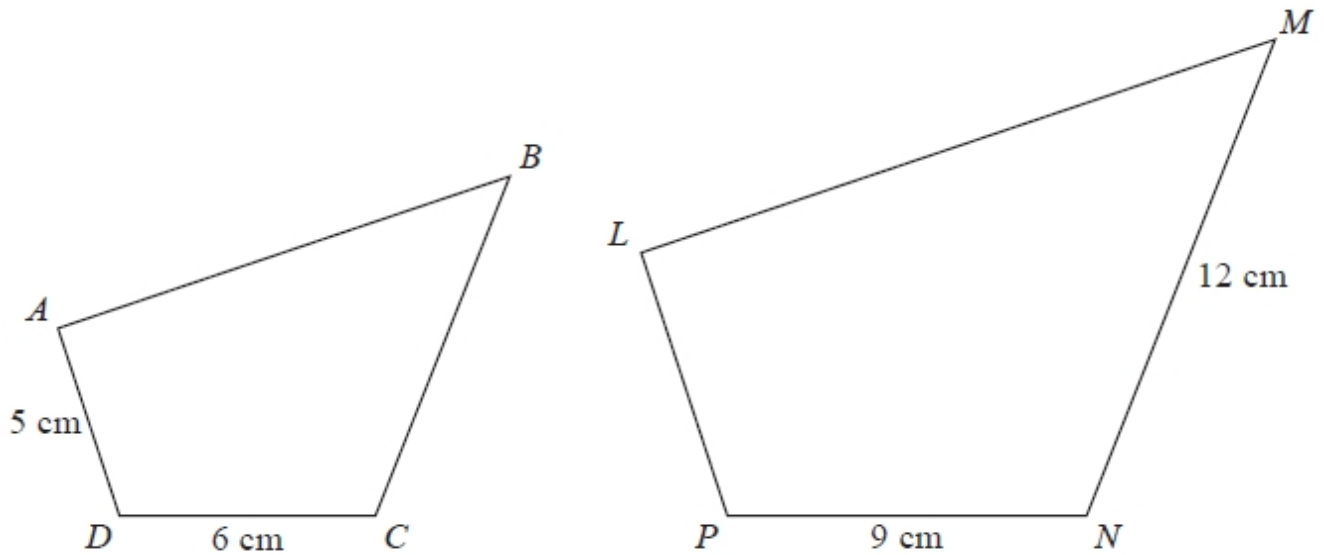
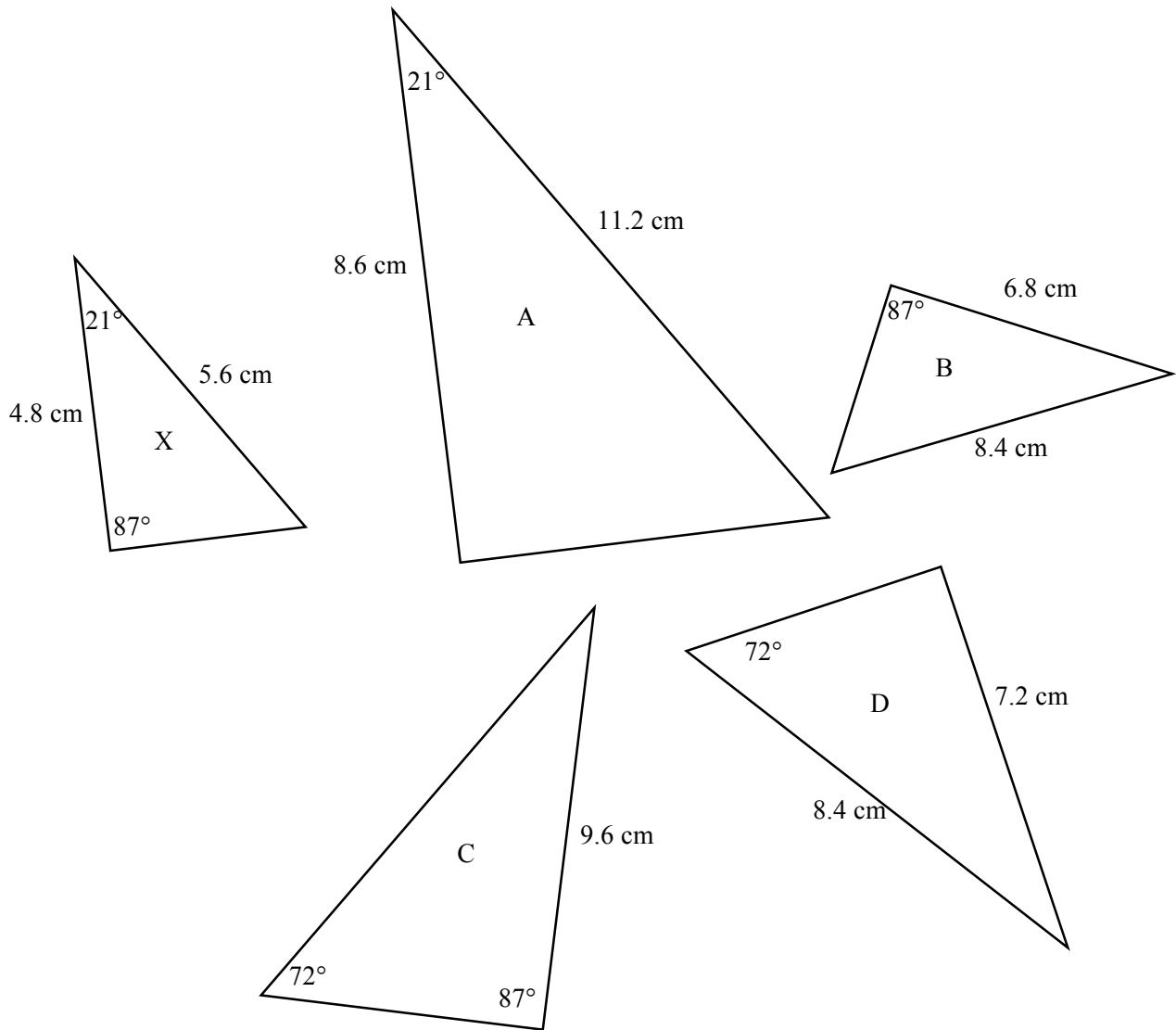


Diagram **NOT** accurately drawn

Work out the length of LP .

Q4. Which triangle is similar to triangle X?



Q5. $ABCD$ and $AEFG$ are mathematically similar trapeziums.

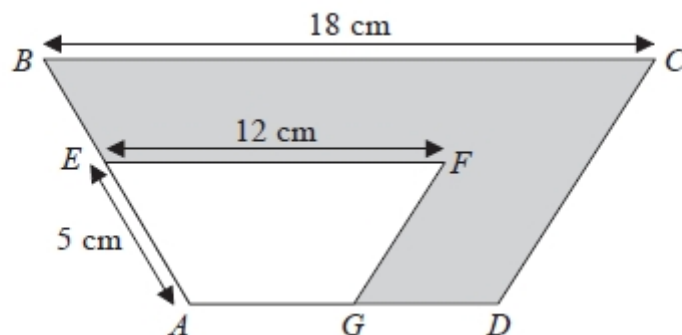
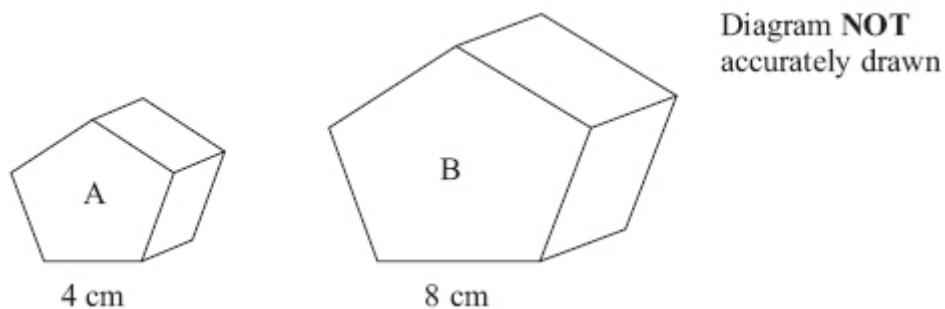


Diagram NOT
accurately drawn

Trapezium $AEFG$ has an area of 36 cm^2 .
Work out the area of the shaded region.

[\[Q6–7 linked\]](#)

Q6. The diagram shows two similar solids, A and B.

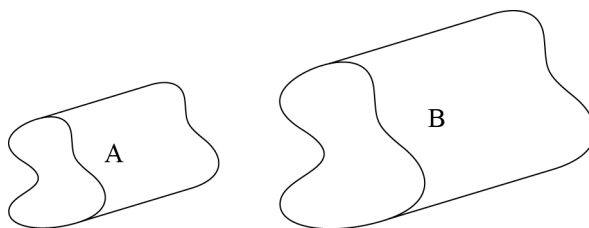


Solid A has a volume of 80 cm^3 .

Write the relationship between the volume of shape A and the volume of shape B as a ratio in its simplest form

Q7. Work out the volume of solid B in question 7.

Q8. Prisms A and B are similar.



The surface area of A is 135 cm^2 . The surface area of B is 240 cm^2 .
The volume of A is 864 cm^3 .

Work out the volume of prism B.

Q9. A frustrum is made by removing a small cone from a similar large cone.

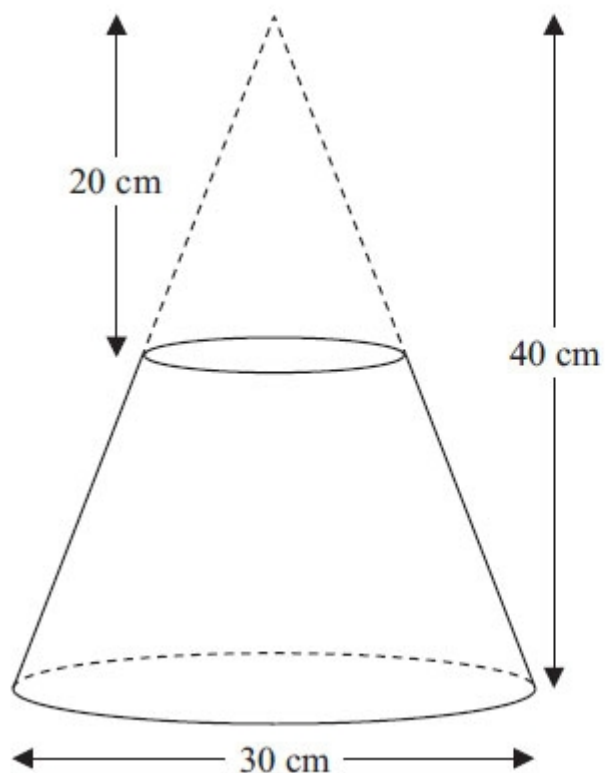


Diagram **NOT**
accurately drawn

The height of the small cone is 20 cm.

The height of the large cone is 40 cm.

The diameter of the base of the large cone is 30 cm.

Work out the volume of the frustrum.

Give your answer correct to 3 significant figures.

Q10.

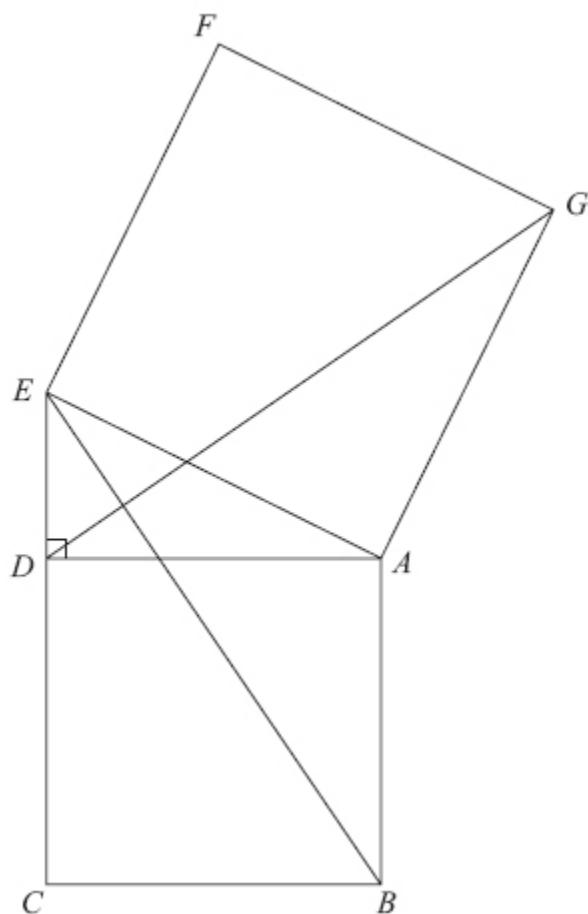


Diagram **NOT**
accurately drawn

In the diagram,

ADE is a right-angled triangle,
 $ABCD$ and $AEFG$ are squares.

Prove that triangle ABE is congruent to triangle ADG .

Topics listed in objectives

- Understand and use SSS, SAS, ASA and RHS conditions to prove the congruence of triangles using formal arguments, and to verify standard ruler and pair of compasses constructions;
- Solve angle problems by first proving congruence;
- Understand similarity of triangles and of other plane shapes, and use this to make geometric inferences;
- Prove that two shapes are similar by showing that all corresponding angles are equal in size and/or lengths of sides are in the same ratio/one is an enlargement of the other, giving the scale factor;
- Use formal geometric proof for the similarity of two given triangles;
- Understand the effect of enlargement on angles, perimeter, area and volume of shapes and solids;
- Identify the scale factor of an enlargement of a similar shape as the ratio of the lengths of two corresponding sides, using integer or fraction scale factors;
- Write the lengths, areas and volumes of two shapes as ratios in their simplest form;
- Find missing lengths, areas and volumes in similar 3D solids;
- Know the relationships between linear, area and volume scale factors of mathematically similar shapes and solids;
- Use the relationship between enlargement and areas and volumes of simple shapes and solids;
- Solve problems involving frustums of cones where you have to find missing lengths first using similar triangles.

Answers

- Q1. A and D
Q2. $w = 21$ cm
Q3. 7.5 cm
Q4. C
Q5. 45 cm^2
Q6. 1 : 8
Q7. 640 cm^3
Q8. 2048 cm^3
Q9. 8250 cm^3
Q10. $AD = AB$ and $AE = AG$; angle $EAB =$ angle DAG , so SAS