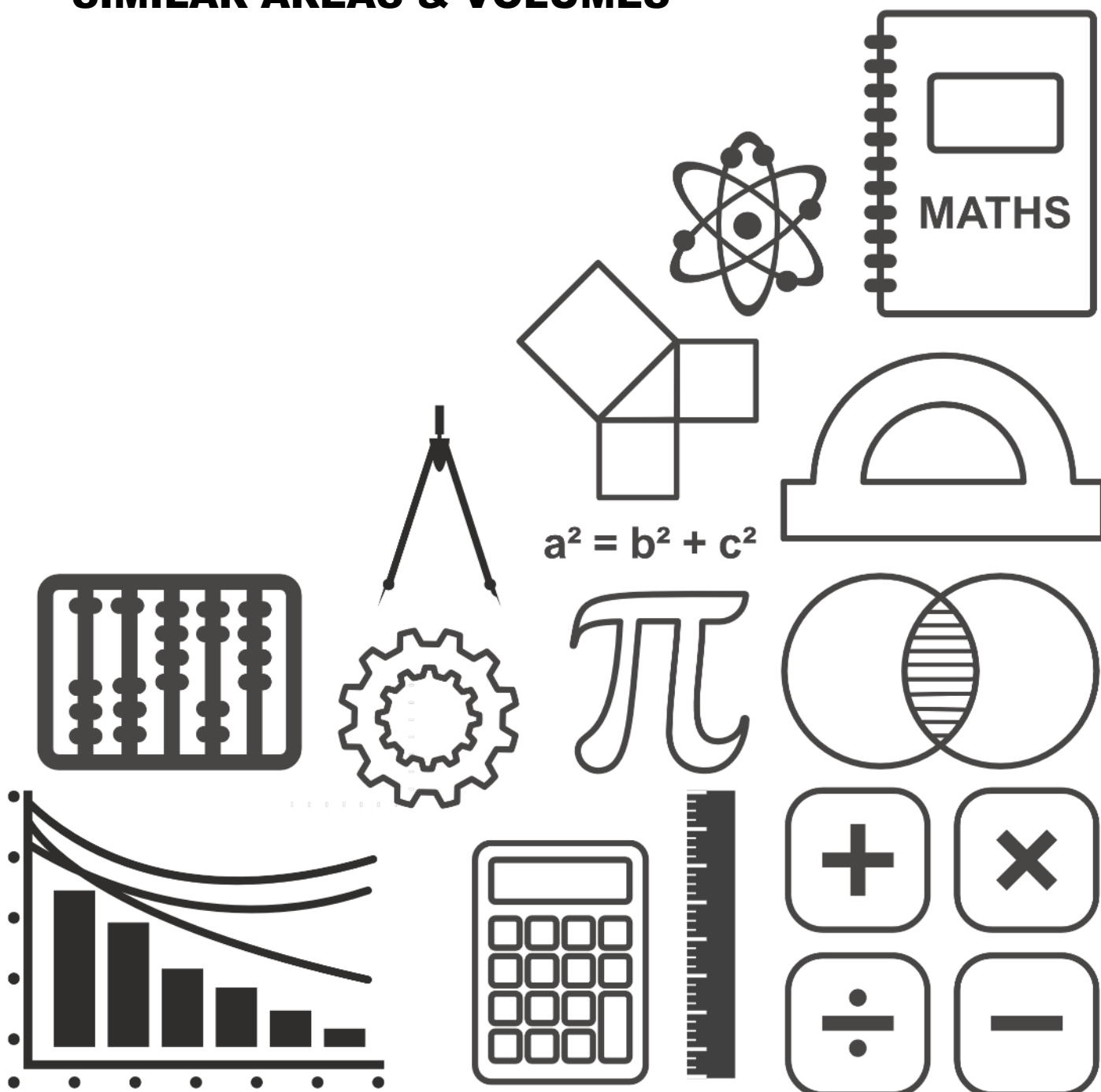
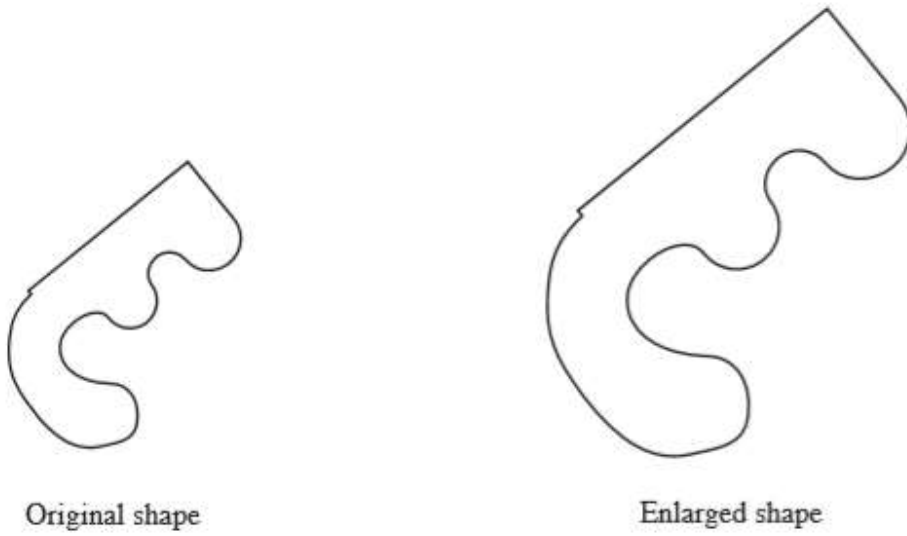


# MATHSDIY

## GCSE TOPIC BOOKLET SIMILAR AREAS & VOLUMES



- The diagram shows a shape and an enlargement of the shape.



*Diagram not drawn to scale.*

The height of the original shape is 1.6 cm and the height of the enlarged shape is 3.2 cm. The area of the original shape is 5.2 cm<sup>2</sup>. Find the area of the enlarged shape.

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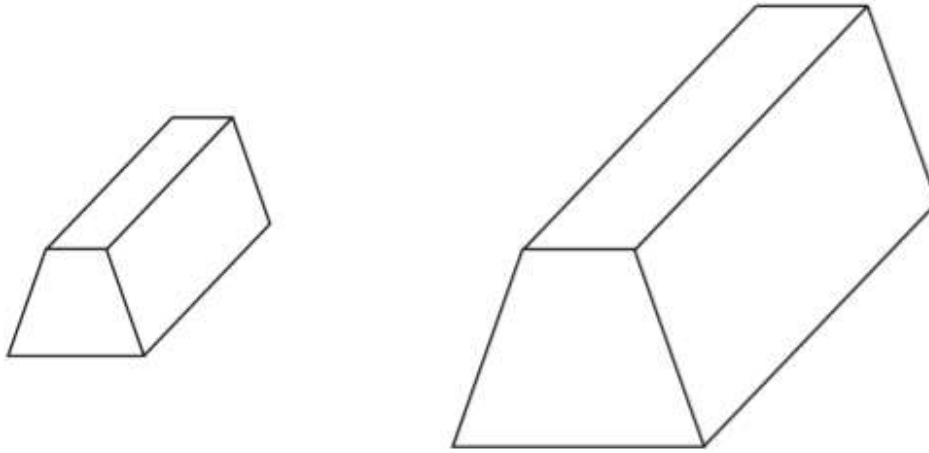
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[2]

2. The prisms shown below are similar.



*Diagrams not drawn to scale.*

The area of the uniform cross-section of the smaller prism is  $5 \text{ cm}^2$  and its length is  $3 \text{ cm}$ . The area of the cross-section of the larger prism is  $80 \text{ cm}^2$ . Calculate the volume of the larger prism.

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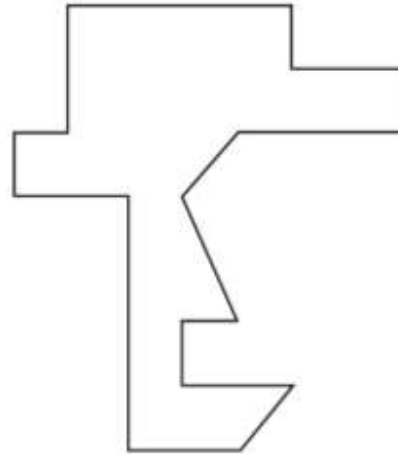
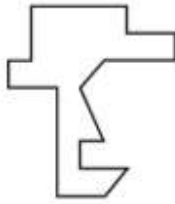
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[5]

3. The diagram shows two **similar** shapes.



*Diagrams not drawn to scale.*

Each length on the larger shape is three times the corresponding length on the smaller shape.  
 The area of the larger shape is  $360 \text{ cm}^2$ . Find the area of the smaller shape.

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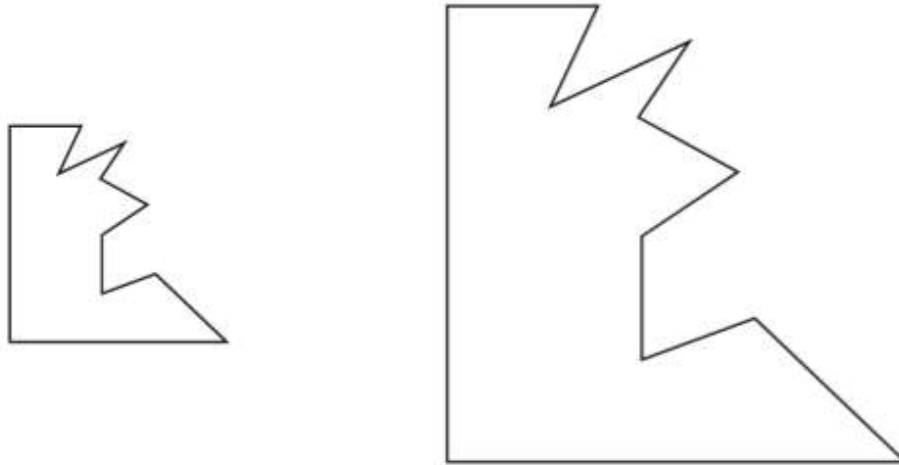
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[3]

4. The diagram shows two **similar** shapes.



*Diagram not drawn to scale.*

Each length on the larger shape is three times the corresponding length on the smaller shape.  
 The area of the larger shape is  $90 \text{ cm}^2$ . Find the area of the smaller shape.

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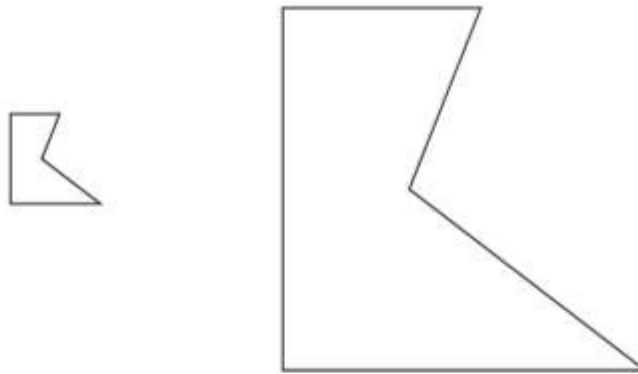
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[3]

5. The diagram shows two similar shapes.



*Diagram not drawn to scale*

Each length on the larger shape is four times the corresponding length on the smaller shape. The area of the smaller shape is  $3.5 \text{ cm}^2$ . Find the area of the larger shape.

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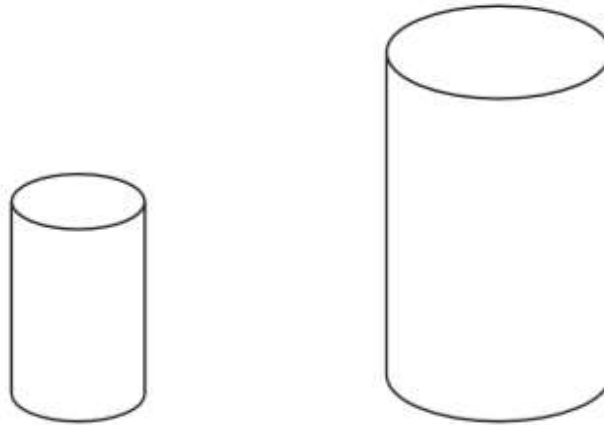
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Area of larger shape .....  $\text{cm}^2$

[3]

6. The diagram shows two similar cylinders.



*Diagrams not drawn to scale.*

The areas of the ends of the smaller and larger cylinders are  $16 \text{ cm}^2$  and  $100 \text{ cm}^2$  respectively. Given that the height of the larger cylinder is  $12.5 \text{ cm}$ , find the height of the smaller cylinder.

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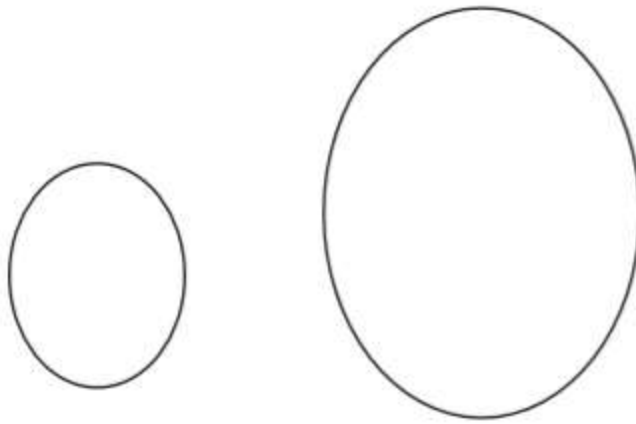
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[3]

7. The diagram shows two shapes.



*Diagram not drawn to scale.*

The larger shape is an enlargement of the smaller shape with a scale factor 3. The area of the smaller shape is  $5 \text{ cm}^2$ . Calculate the area of the larger shape.

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[3]



8. A company produces suitcases with dimensions 55 cm by 40 cm by 20 cm.



The company has been asked to produce a new, smaller suitcase.

- The new suitcase must be **similar** to the original suitcase, with dimensions in the same proportions.
- The volume of the new smaller suitcase should be **half** the volume of the original suitcase.

Find the dimensions of the new smaller suitcase.

Give your dimensions correct to an appropriate degree of accuracy. [4]

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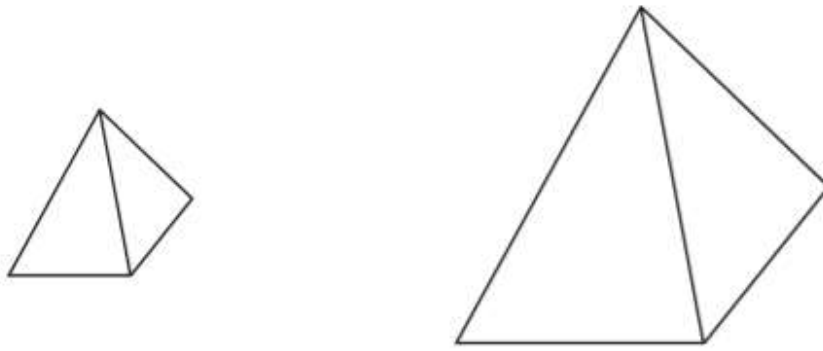
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9.



*Diagram not drawn to scale.*

The diagram shows two similar square based pyramids, the volume of the smaller pyramid is  $30 \text{ cm}^3$  and the volume of the larger pyramid is  $1920 \text{ cm}^3$ .

The length of the side of the base of the smaller square based pyramid is 5 cm.

Calculate the length of the side of the base of the larger pyramid.

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[3]