



Aberdare Community School  
Mathematics Department

WJEC GCSE

**Higher – Non Calculator**  
Shape

## **Similar shapes**

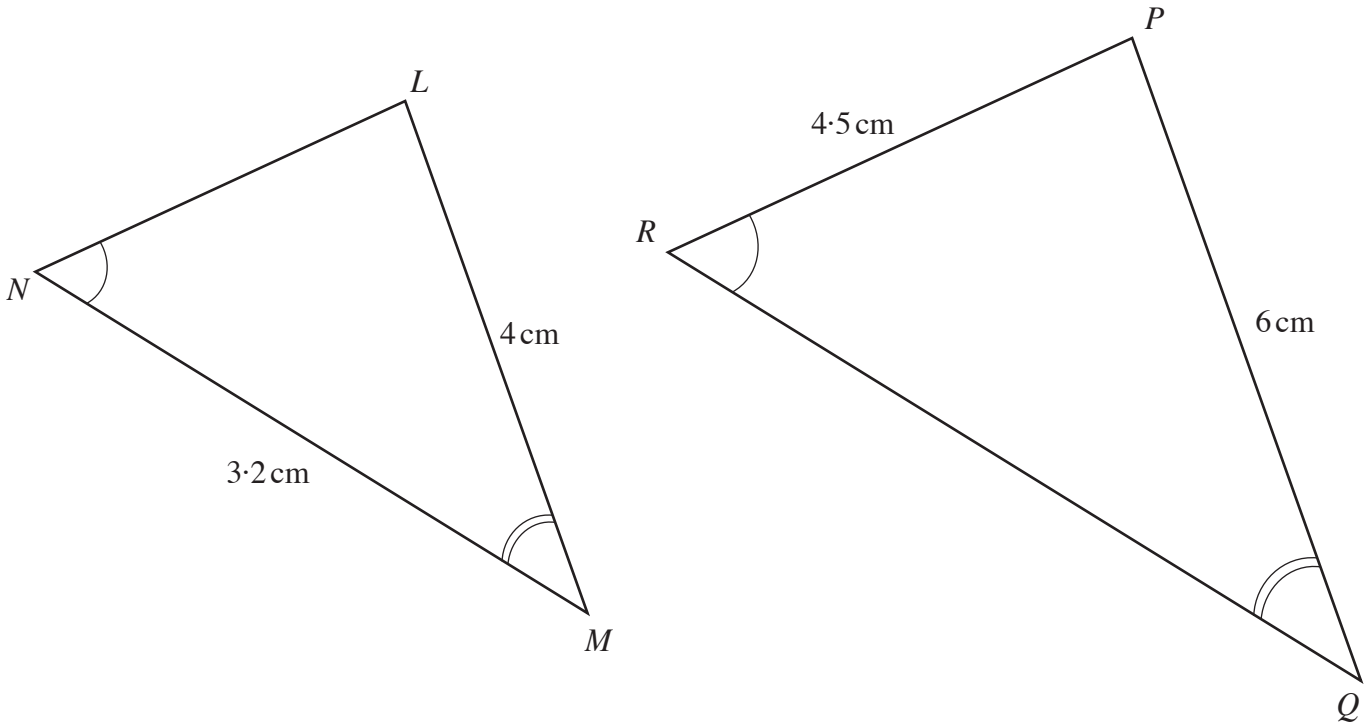
Name: .....

Set: .....

Date: .....

Teacher: .....

16. Triangles  $LMN$  and  $PQR$  are similar, with  $\widehat{LMN} = \widehat{PQR}$ ,  $\widehat{MNL} = \widehat{QRP}$ ,  $LM = 4$  cm,  $MN = 3.2$  cm,  $PR = 4.5$  cm and  $PQ = 6$  cm.



*Diagrams not drawn to scale.*

Showing all your working, find the length of

- (a)  $RQ$ ,

.....  
 .....  
 .....

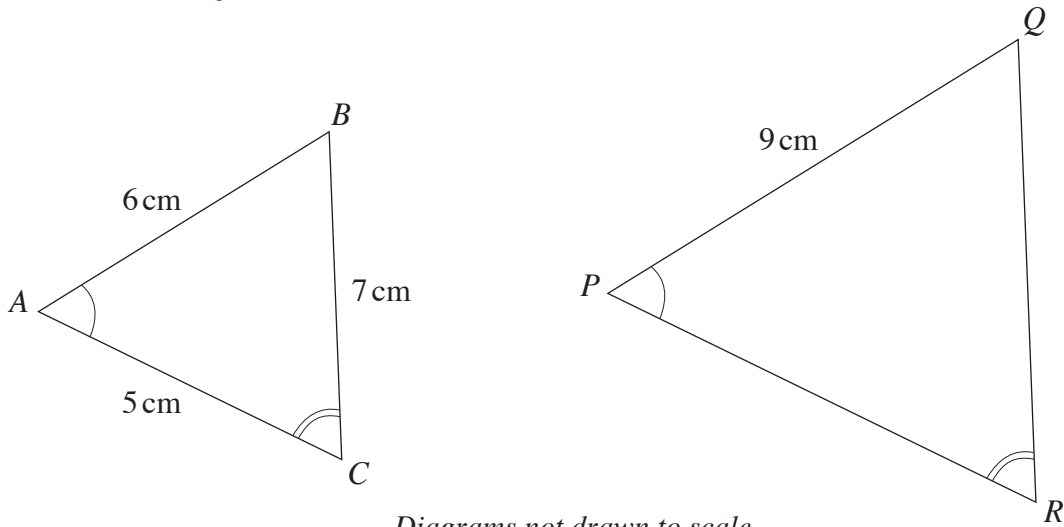
[2]

- (b)  $LN$ .

.....  
 .....  
 .....

[2]

16. Triangles  $ABC$  and  $PQR$  are similar, with  $\widehat{BAC} = \widehat{QPR}$ ,  $\widehat{BCA} = \widehat{QRP}$ ,  $AB = 6$  cm,  $BC = 7$  cm,  $AC = 5$  cm and  $PQ = 9$  cm.



*Diagrams not drawn to scale.*

Showing all your working, find the length of  $QR$ .

.....

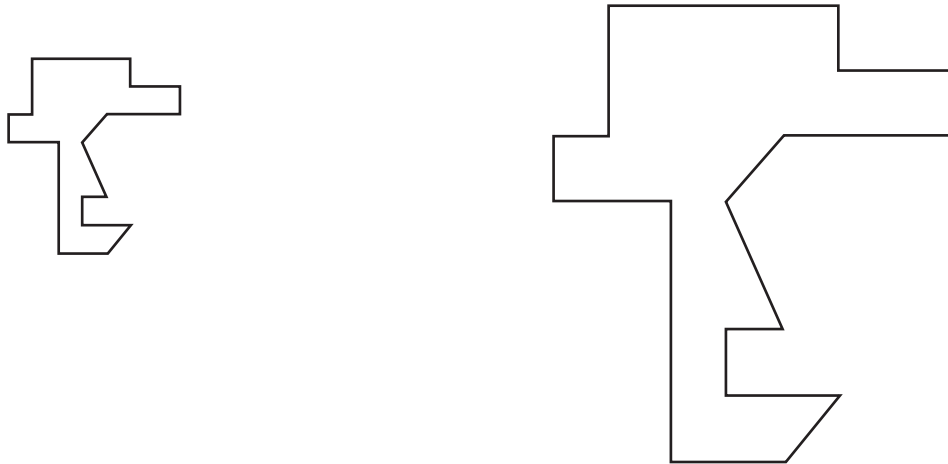
.....

.....

.....

[2]

22. 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.

.....

.....

.....

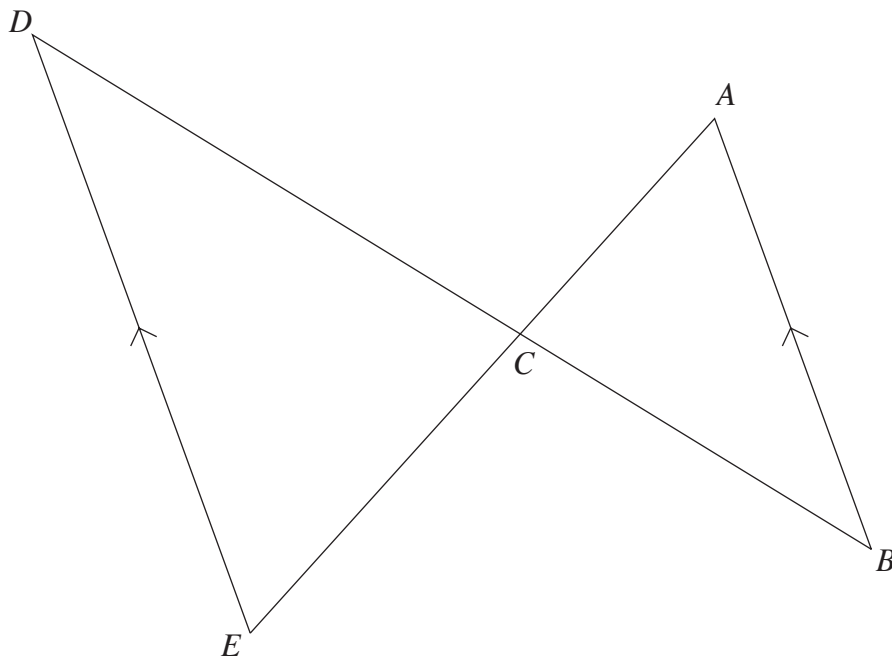
.....

.....

[3]

16. In the diagram,  $AB$  is parallel to  $DE$ .

(a) Show that triangles  $ABC$  and  $EDC$  are similar.



*Diagram not drawn to scale.*

.....

.....

.....

.....

[2]

(b) The lengths  $AB = 8\text{cm}$ ,  $BC = 10\text{cm}$  and  $DC = 15\text{cm}$ .  
Calculate the length of  $DE$ .

.....

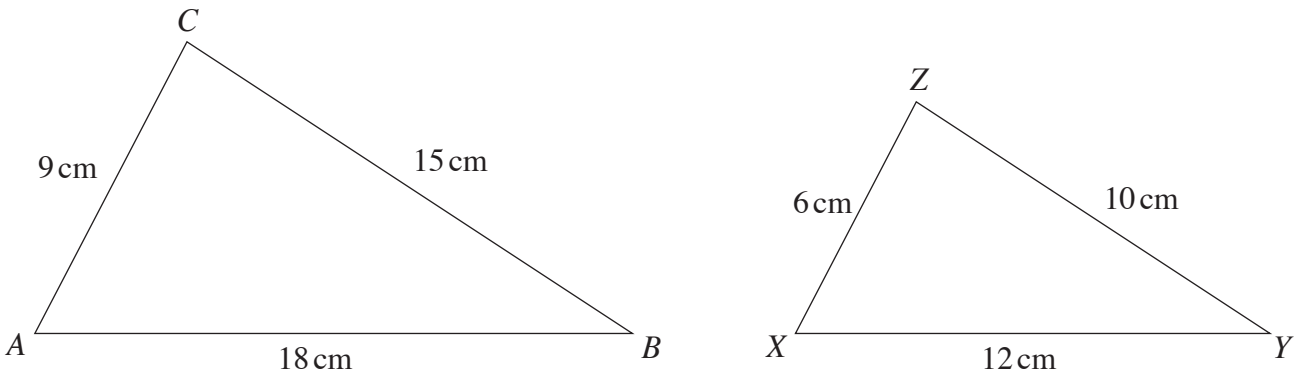
.....

.....

.....

[2]

16. (a) Explain clearly why triangles  $ABC$  and  $XYZ$  are similar.



*Diagrams not drawn to scale.*

.....

.....

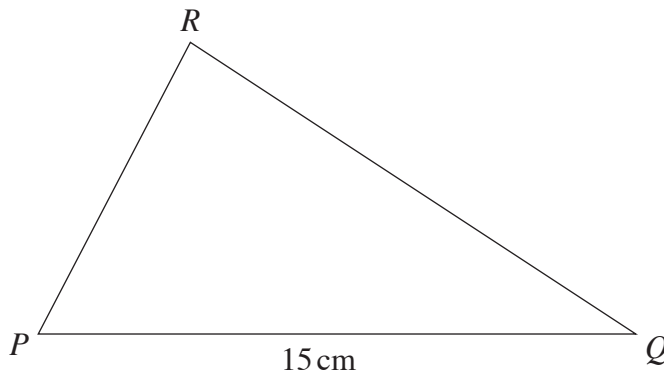
.....

.....

.....

[2]

(b) Triangle  $PQR$ , in which  $PQ = 15\text{ cm}$ , is similar to both triangles  $ABC$  and  $XYZ$ . Calculate the length of  $QR$ .



*Diagram not drawn to scale.*

.....

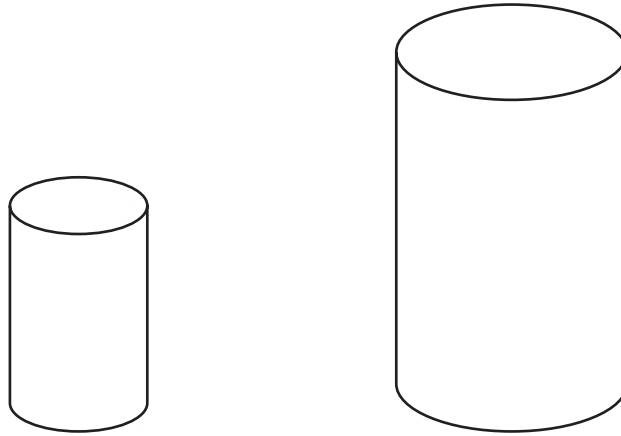
.....

.....

.....

[2]

19. 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.

.....

.....

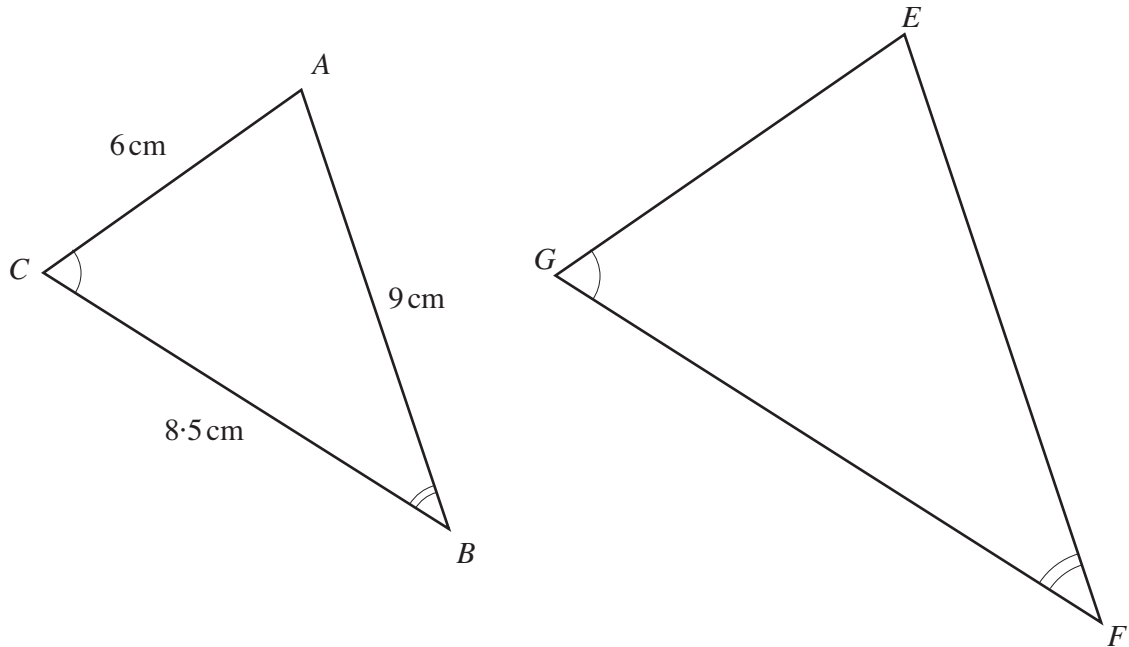
.....

.....

.....

[3]

14. (a) Triangles  $ABC$  and  $EFG$  are similar.  
Their corresponding sides are in the ratio 2:3.  
Calculate the length of  $EF$ .



*Diagram not drawn to scale.*

.....

.....

.....

.....

.....

.....

.....

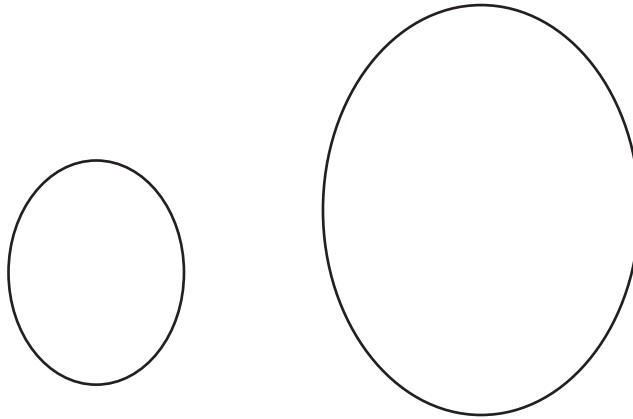
.....

.....

[2]



(b) 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.

.....

.....

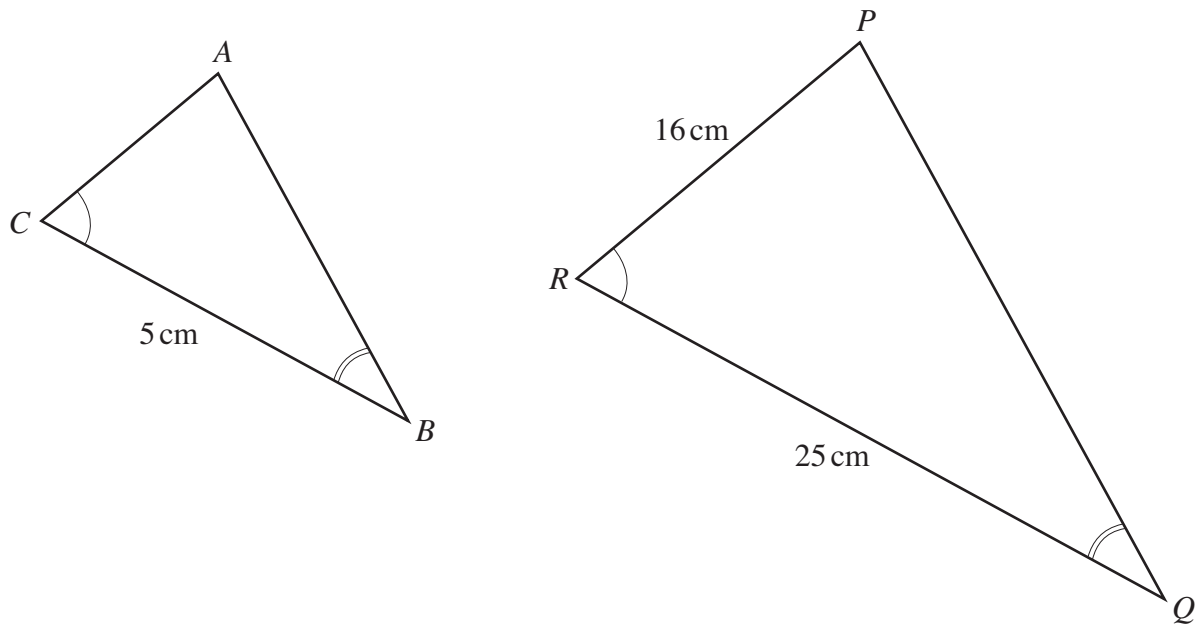
.....

.....

.....

[3]

12. The diagram shows two similar triangles,  $ABC$  and  $PQR$ .



*Diagram not drawn to scale.*

Given that  $CB = 5$  cm,  $RQ = 25$  cm and  $PR = 16$  cm, find the length of  $AC$ .

.....

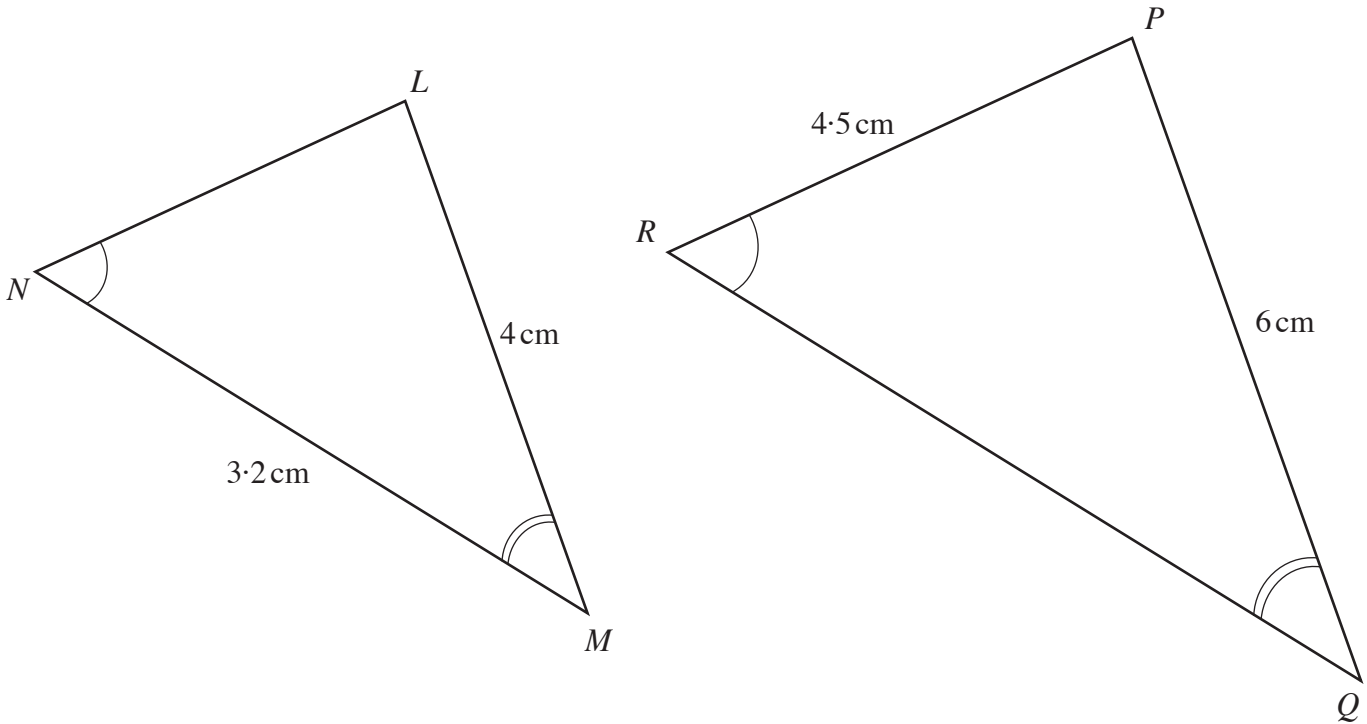
.....

.....

.....

[2]

15. Triangles  $LMN$  and  $PQR$  are similar, with  $\widehat{LMN} = \widehat{PQR}$ ,  $\widehat{MNL} = \widehat{QRP}$ ,  $LM = 4$  cm,  $MN = 3.2$  cm,  $PR = 4.5$  cm and  $PQ = 6$  cm.



*Diagrams not drawn to scale.*

Showing all your working, find the length of

- (a)  $RQ$ ,

.....

.....

.....

.....

[2]

- (b)  $LN$ .

.....

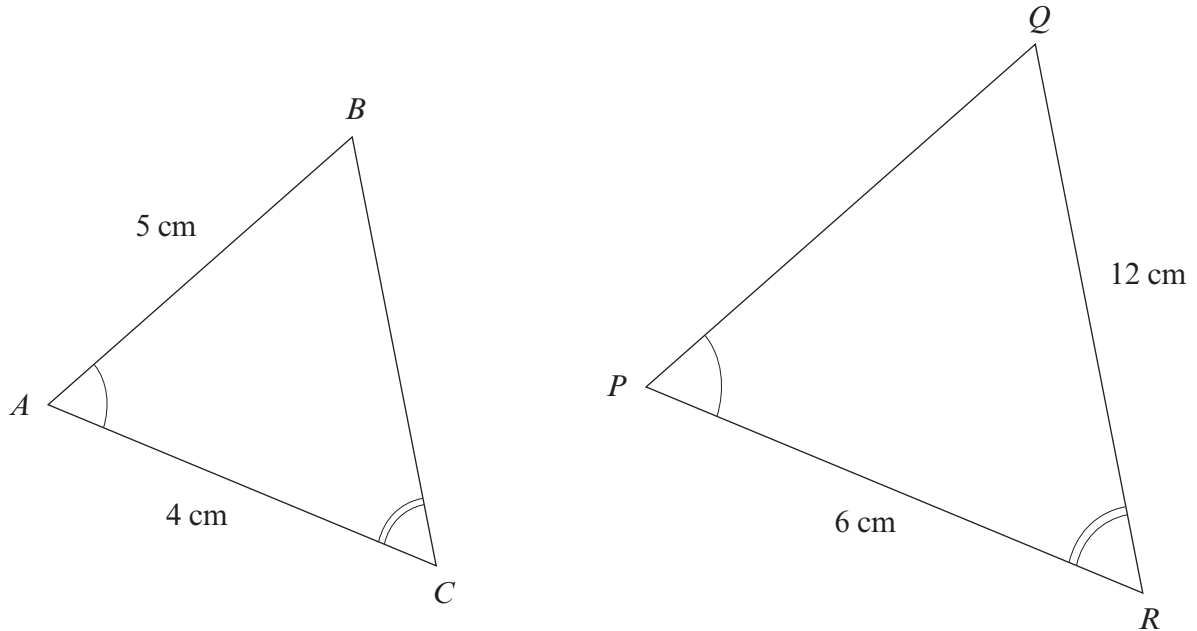
.....

.....

.....

[2]

14. Triangles  $ABC$  and  $PQR$  are similar, with  $\widehat{BAC} = \widehat{QPR}$ ,  $\widehat{BCA} = \widehat{QRP}$ ,  $AB = 5$  cm,  $AC = 4$  cm,  $PR = 6$  cm and  $RQ = 12$  cm.



*Diagrams not drawn to scale.*

Showing all your working, find

- (a) the length of  $QP$ ,

.....

.....

.....

.....

[2]

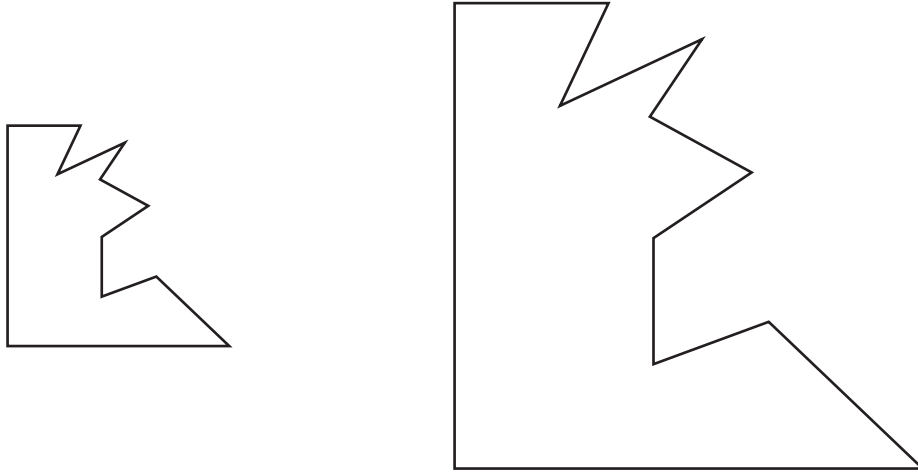
- (b) the length of  $BC$ .

.....

.....

[1]

16. 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.

.....

.....

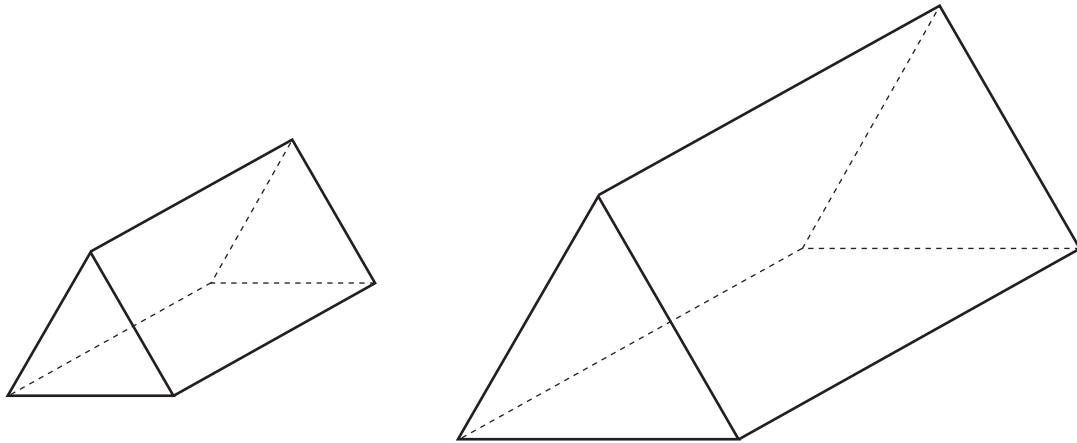
.....

.....

.....

[3]

13. The diagram shows two similar triangular prisms.



*Diagram not drawn to scale*

The areas of the ends of the smaller and larger prisms are  $16 \text{ cm}^2$  and  $25 \text{ cm}^2$  respectively. Given that the length of the larger prism is  $7.5 \text{ cm}$ , find the length of the smaller prism.

.....

.....

.....

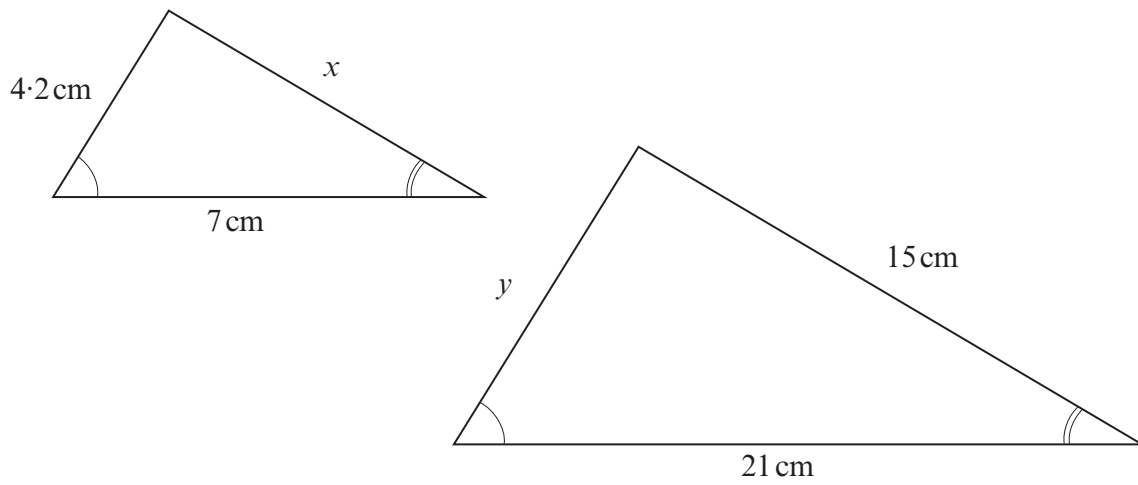
.....

.....

.....

[3]

11. (a) The diagram shows two similar triangles.



*Diagram not drawn to scale*

Calculate the lengths of the sides marked  $x$  and  $y$ .

.....

.....

.....

.....

.....

.....

.....

.....

.....

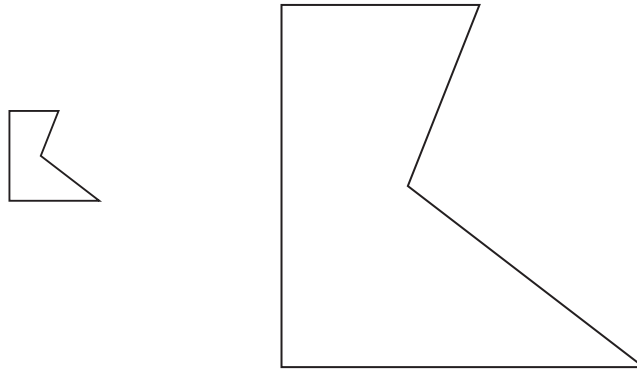
.....

$x = \dots\dots\dots \text{ cm}$

$y = \dots\dots\dots \text{ cm}$

[4]

(b) 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.

.....

.....

.....

.....

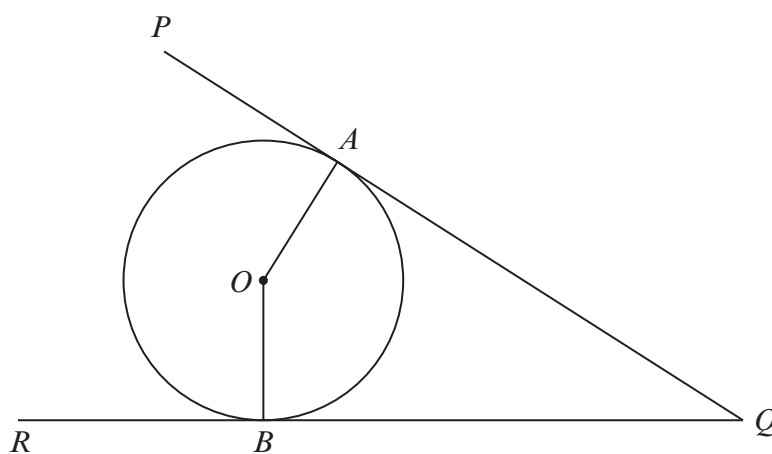
.....

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

[3]



16. The points  $A$  and  $B$  lie on the circumference of a circle with centre  $O$ .  
The straight lines  $PAQ$  and  $RBQ$  are tangents to the circle.



*Diagram not drawn to scale*

You are given that  $\widehat{AOB} = 2x$ , where  $x$  is measured in degrees.

Write down the size of  $\widehat{AOQ}$  in terms of  $x$ .  
Give reasons in your answer.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

[4]



