



Aberdare Community School  
Mathematics Department

WJEC GCSE

**Higher – Non Calculator**  
Shape

# Pythagoras theorem

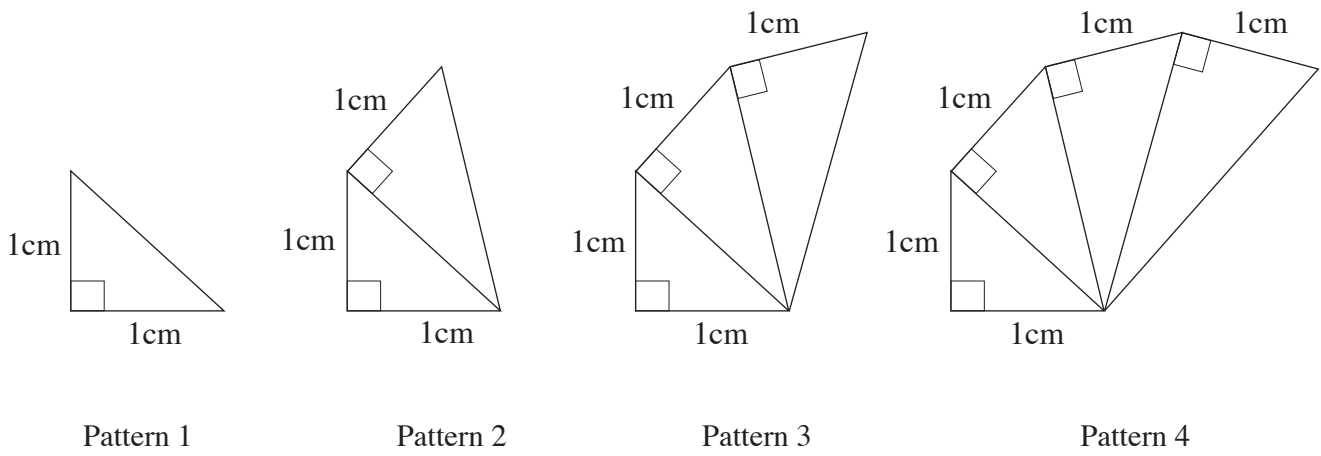
Name: .....

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Teacher: .....

20. Patterns are generated as shown in the diagram.



*Diagrams not drawn to scale.*

Find the perimeter of Pattern 6 in the form  $a + \sqrt{b}$ , where  $a$  and  $b$  are whole numbers. Show your working.

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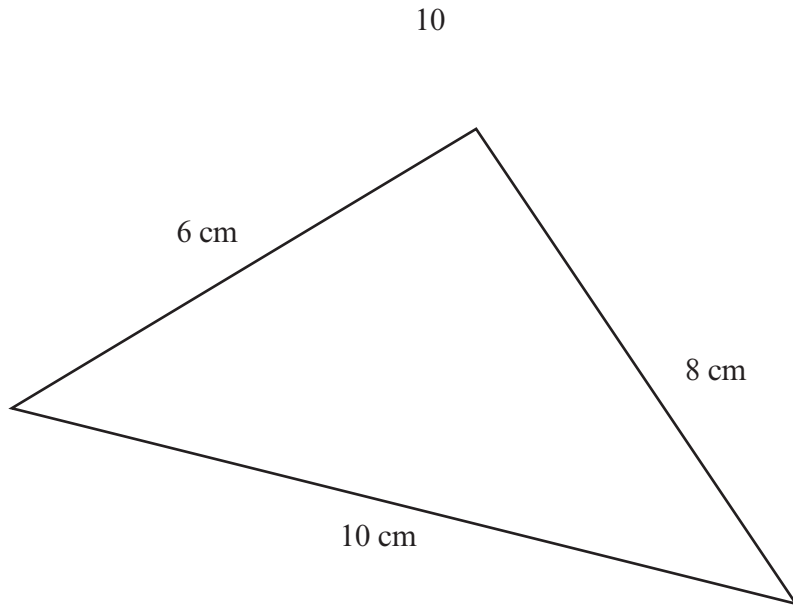
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6. (a)



*Diagram not drawn to scale*

Show, by calculation, that the triangle drawn above is a right-angled triangle.

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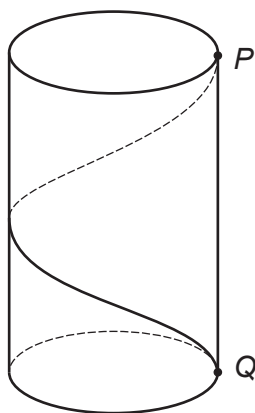
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13. The diagram shows a cylinder.



*Diagram not drawn to scale*

The cylinder has radius  $r$  cm and height  $h$  cm.

The points  $P$  and  $Q$  are on the circumferences at opposite ends of the cylinder.  
The point  $P$  is vertically above point  $Q$ .

By considering the net of the cylinder, find an expression for the shortest distance from  $P$  to  $Q$  when travelling **around** the cylinder.

Give your expression in terms of  $\pi$ ,  $h$  and  $r$ .

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