Trigonometry

Do Now...

Find the value of the following to 3dp.

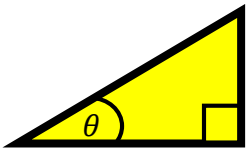
1. sin10°
2. cos45°
3. tan45°
4. tan62°
5. sin14°
6. sin69°
7. tan14°
8. cos32°
9. cos5°
10. sin85°

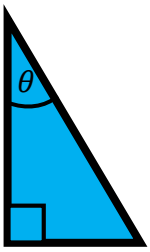
Find the value of the following to 1dp.

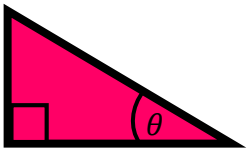
11. $\tan^{-1}(2.47)$
12. $\sin^{-1}(0.82)$
13. $\tan^{-1}(0.0699)$
14. $\sin^{-1}(0.258)$
15. $\cos^{-1}(0.258)$
16. $\sin^{-1}(1)$
17. $\cos^{-1}(0)$
18. $\cos^{-1}(0.978)$
19. $\tan^{-1}(4.70)$
20. $\tan^{-1}(0.158)$

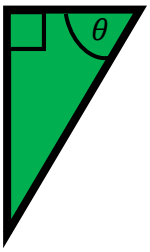
Labelling Triangles

Label the sides of the triangles below in relation to the angle θ.

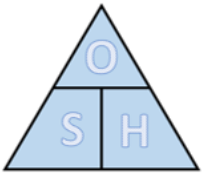
1. 

2. 

3. 

4. 

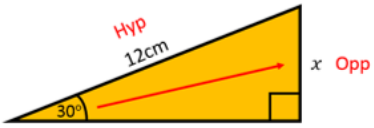
Using Sine



$\sin\theta^\circ = \frac{\text{opposite}}{\text{hypotenuse}}$

opposite = $\sin\theta^\circ$ x hypotenuse

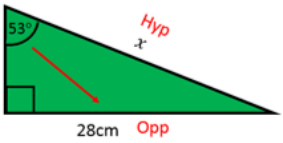
$\text{hypotenuse} = \frac{\text{opposite}}{\sin\theta^\circ}$



opposite = $\sin\theta^\circ$ x hypotenuse

opposite = $\sin30^\circ$ x 12

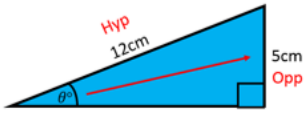
x = 6cm



$\text{hypotenuse} = \frac{\text{opposite}}{\sin\theta^\circ}$

$\text{hypotenuse} = \frac{28}{\sin53^\circ}$

x = 35.06cm



$\sin\theta^\circ = \frac{\text{opposite}}{\text{hypotenuse}}$

$\sin\theta^\circ = \frac{5}{12}$

$\sin\theta^\circ = 0.4166666...$

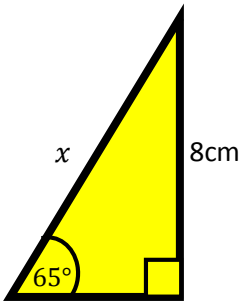
$\theta^\circ = \sin^{-1}(0.416666....)$

θ = 24.6°

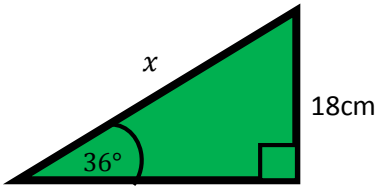
Consolidation 1

In each of these questions find the length of the side marked x to 1 decimal place.

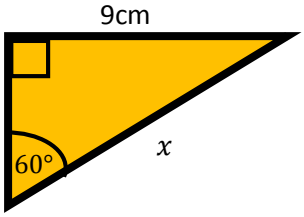
1.



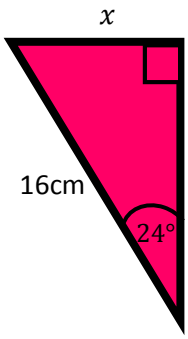
2.



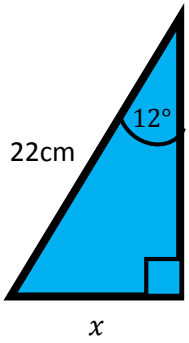
3.



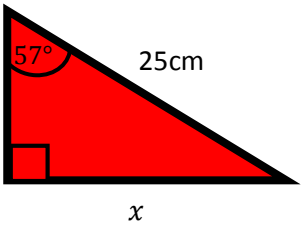
4



5.

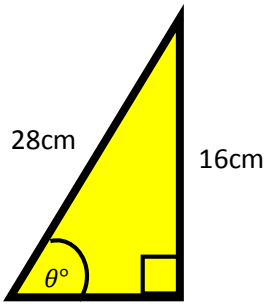


6.

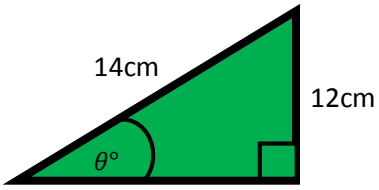


In each of these questions find the size of the angle marked θ to 1 decimal place.

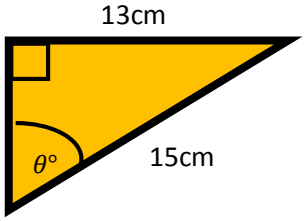
7.



8.



9.



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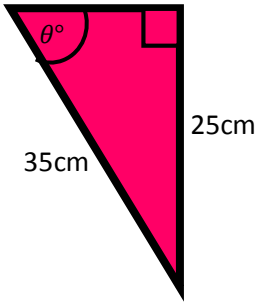

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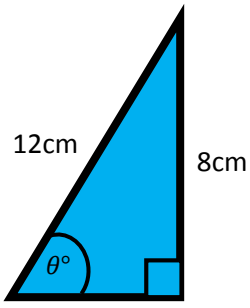
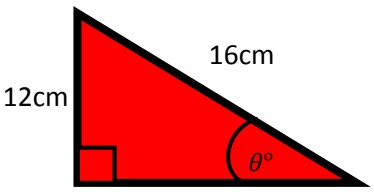
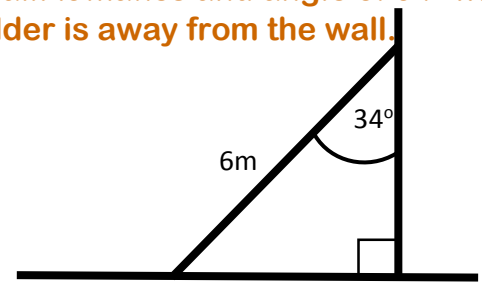


12.

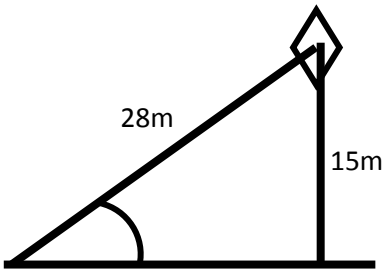


Extension 1

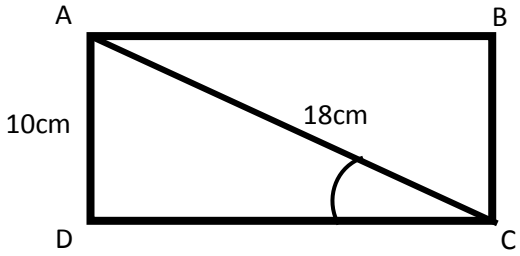
1. A ladder that is 6m long is placed against a wall. It makes and angle of 34° with the wall. Find the distance the base of the ladder is away from the wall.



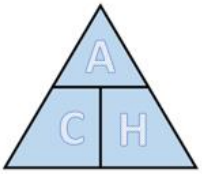
2. A boy gets his kite stuck in a tree. He knows that the amount of string let out is 28 metres and tree is 15 metres tall. Find the angle that the string makes with the ground.



3. ABCD is a rectangular sheet of paper. AC = 18cm and AD = 10cm. Calculate the angle ACD.



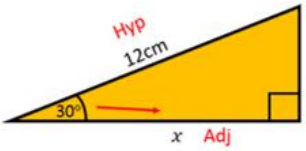
Using Cosine



$\cos\theta^\circ = \frac{\text{adjacent}}{\text{hypotenuse}}$

adjacent = $\cos\theta^\circ$ x hypotenuse

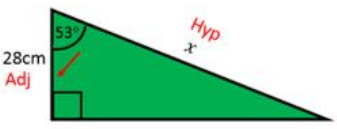
hypotenuse = $\frac{\text{adjacent}}{\cos\theta^\circ}$



adjacent = $\cos\theta^\circ$ x hypotenuse

adjacent = $\cos 30^\circ$ x 12

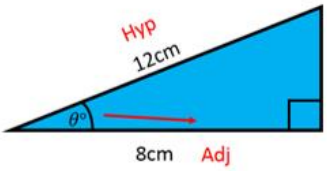
x = 10.4cm



hypotenuse = $\frac{\text{adjacent}}{\cos\theta^\circ}$

hypotenuse = $\frac{28}{\cos 53^\circ}$

x = 46.5cm



$\cos\theta^\circ = \frac{\text{adjacent}}{\text{hypotenuse}}$

$\cos\theta^\circ = \frac{8}{12}$

$\cos\theta^\circ = 0.6666666....$

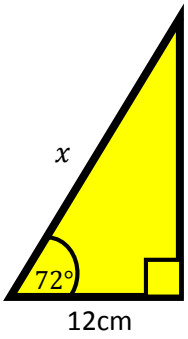
$\theta^\circ = \cos^{-1}(0.666666...)$

$\theta = 48.2^\circ$

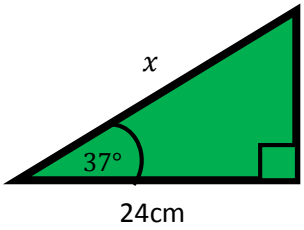
Consolidation 2

In each of these questions find the length of the side marked x to 1 decimal place.

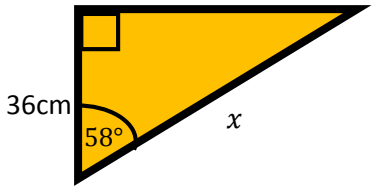
1.



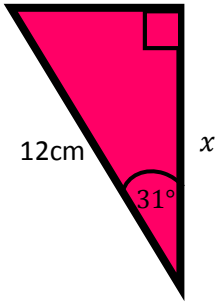
2.



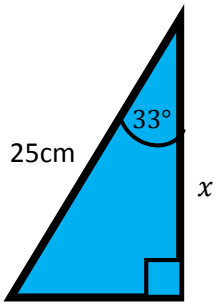
3.



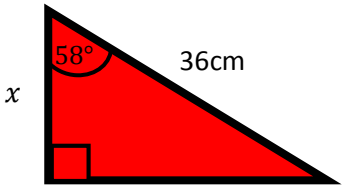
4



5.

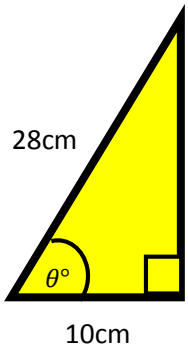


6.

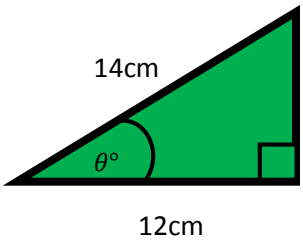


In each of these questions find the size of the angle marked θ to 1 decimal place.

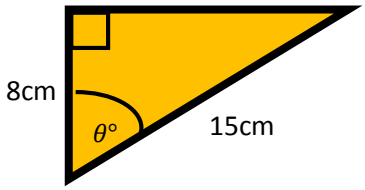
7.



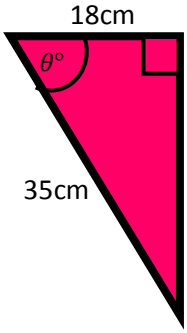
8.



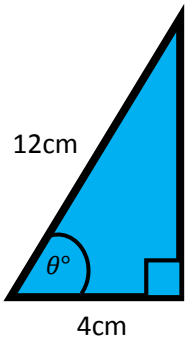
9.



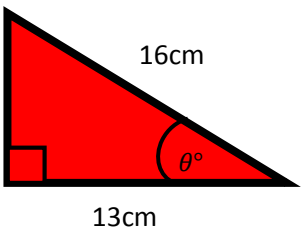
10.



11.

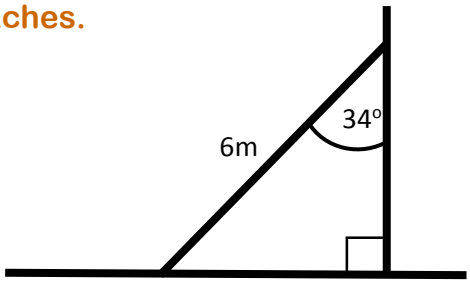


12.

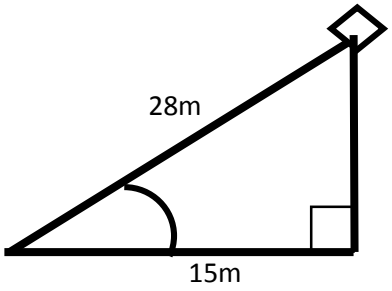


Extension 2

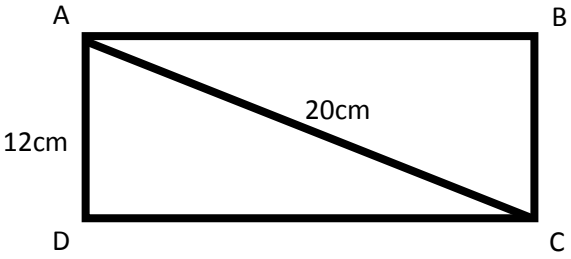
1. A ladder that is 6m long is placed against a wall. It makes and angle of 34° with the wall. Find how high up the wall the ladder reaches.



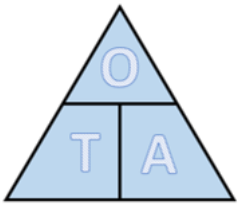
2. A boy gets his kite stuck in a tree. He knows that the amount of string let out is 28 metres and the distance he is from the tree is 15 metres. Find the angle that the string makes with the ground.



3. ABCD is a rectangular sheet of paper. AC = 20cm and AD = 12cm. Calculate the angle ACD and use this to find the length of DC to 1 decimal place.



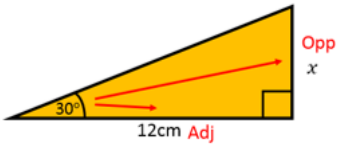
Using Tangent



$\tan\theta° = \frac{\text{opposite}}{\text{adjacent}}$

$\text{opposite} = \tan\theta° \times \text{adjacent}$

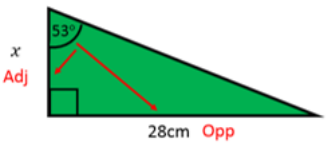
$\text{adjacent} = \frac{\text{opposite}}{\tan\theta°}$



$\text{opposite} = \tan\theta° \times \text{adjacent}$

$\text{opposite} = \tan30° \times 12$

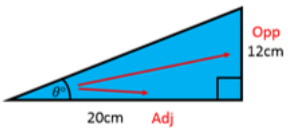
$x = 6.9\text{cm}$



$\text{adjacent} = \frac{\text{opposite}}{\tan\theta°}$

$\text{adjacent} = \frac{28}{\tan53°}$

$x = 21.1\text{cm}$



$\tan\theta° = \frac{\text{opposite}}{\text{adjacent}}$

$\tan\theta° = \frac{12}{20}$

$\tan\theta° = 0.6$

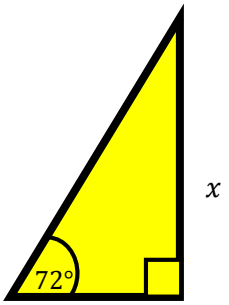
$\theta° = \tan^{-1}(0.6)$

$\theta = 31.0°$

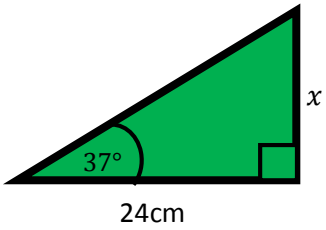
Consolidation 3

In each of these questions find the length of the side marked x to 1 decimal place.

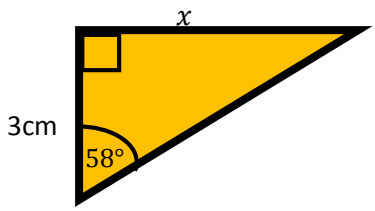
1.



2.



3.



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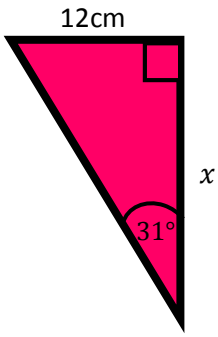
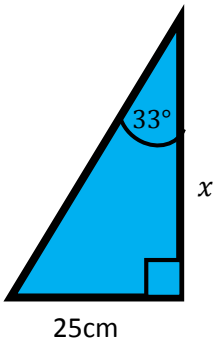
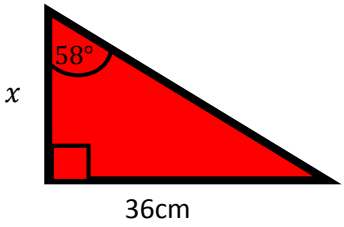


5.

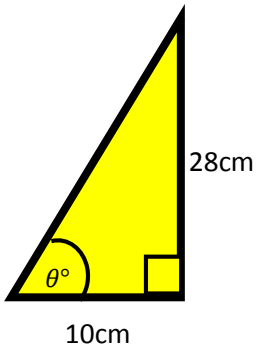


6.



In each of these questions find the size of the angle marked θ to 1 decimal place.

7.



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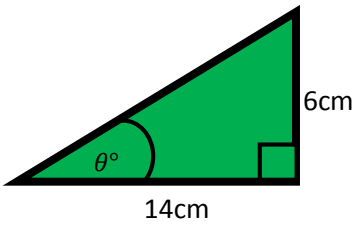

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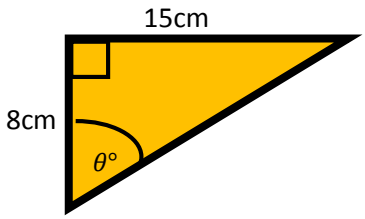

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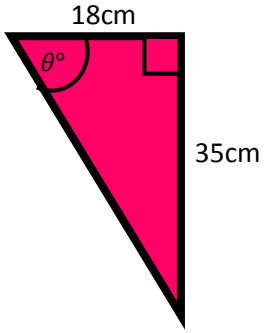

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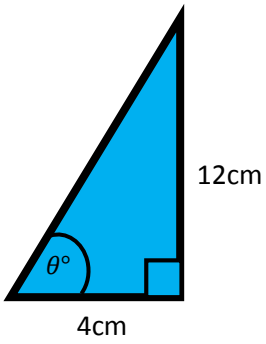

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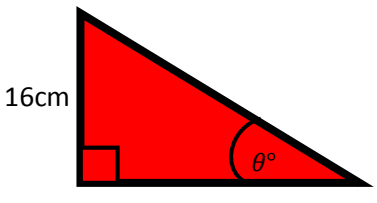
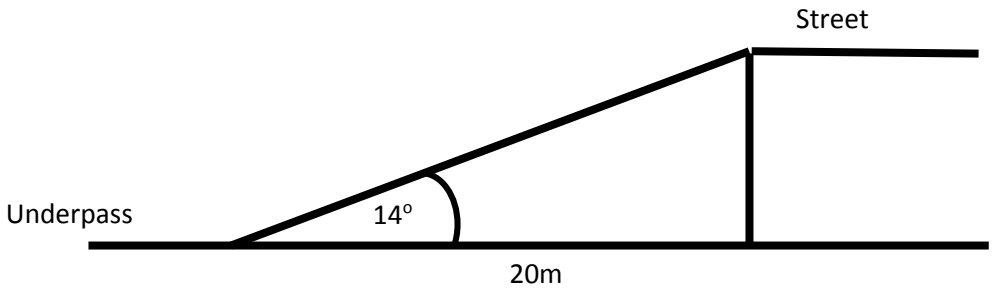
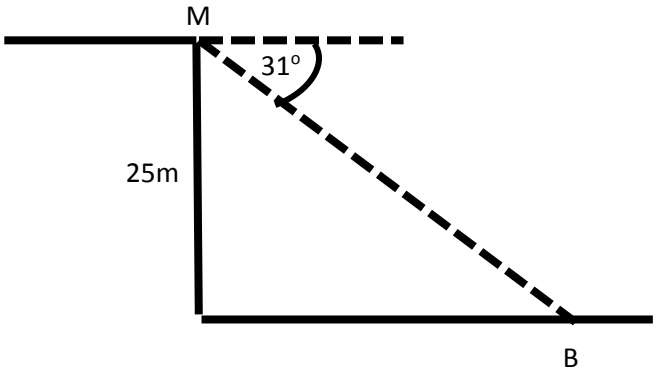


Extension 3

1. The diagram represents a ramp AB leading from an underpass to street level. The ramp makes an angle of 14° with the horizontal and has measurements shown. Calculate the height of the ramp.



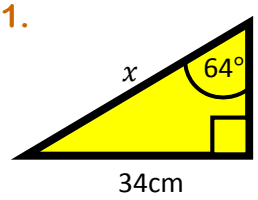
2. A man stands on a cliff M, and sees a boat out to sea, B. The angle of depression from the man to the boat is 31°. The height of the cliff is 25m. Find the distance from the boat the base of the cliff.



Which One?

Write down which trig formula you would use to work out x in each of these:

1.



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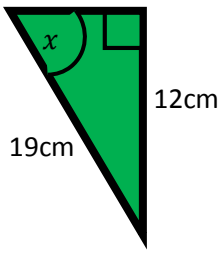

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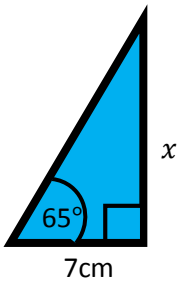

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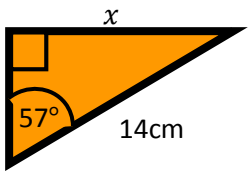

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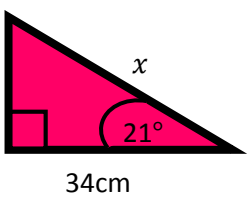

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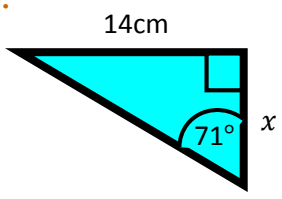

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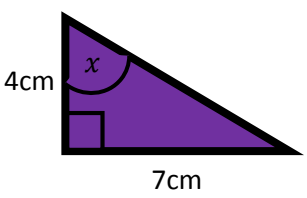

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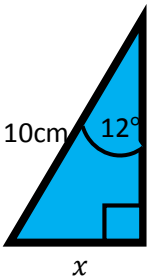
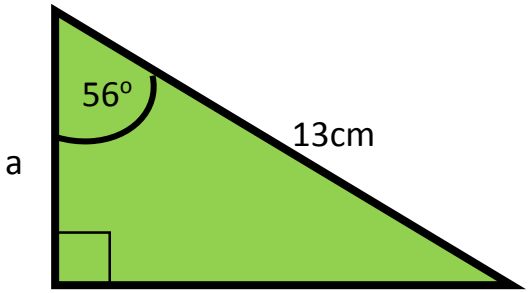


Mixed Practise

In each of the questions below, calculate either the missing angle or side stated. Give your answer correct to 1 decimal place.

1)



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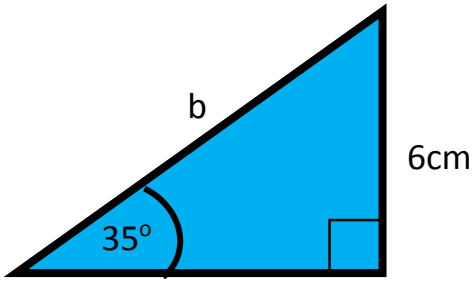

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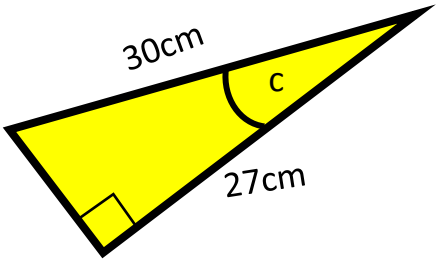

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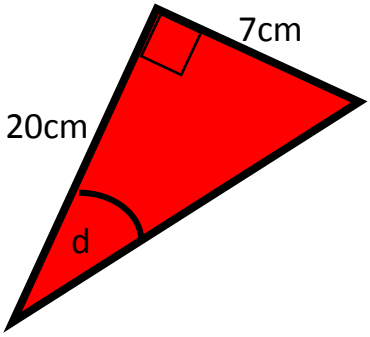

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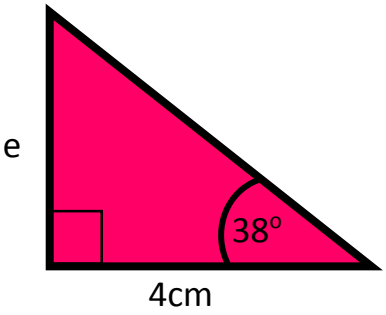

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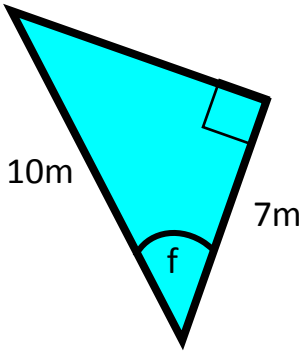

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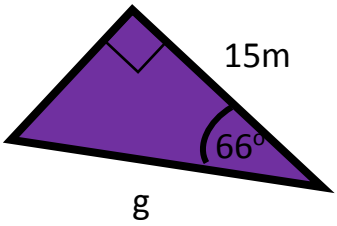

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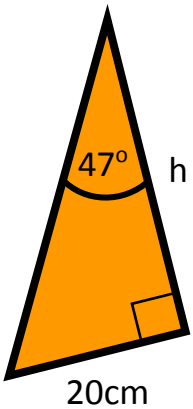

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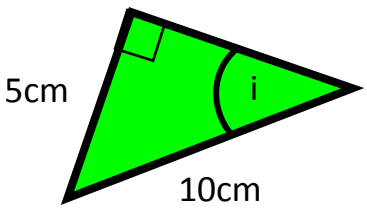

10)