

Trigonometry

Do Now...

Find the value of the following to 3dp.

1. $\sin 15^\circ$
2. $\cos 35^\circ$
3. $\tan 65^\circ$
4. $\tan 42^\circ$
5. $\sin 34^\circ$
6. $\sin 49^\circ$
7. $\tan 34^\circ$
8. $\cos 62^\circ$
9. $\cos 2^\circ$
10. $\sin 83^\circ$

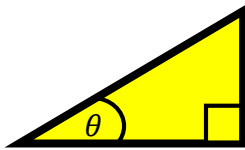
Find the value of the following to 1dp.

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. $\tan^{-1}(0.158)$

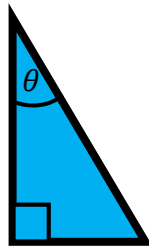
Labelling Triangles

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

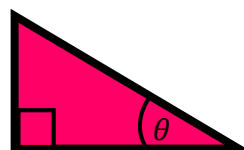
1.



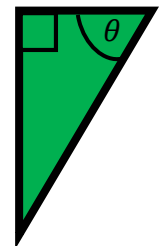
2.



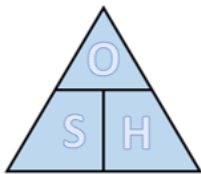
3.



4.



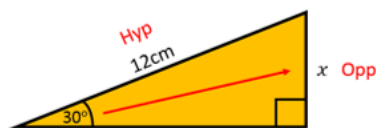
Using Sine



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

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

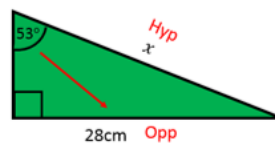
$$\text{hypotenuse} = \frac{\text{opposite}}{\sin \theta^\circ}$$



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

$$\text{opposite} = \sin 30^\circ \times 12$$

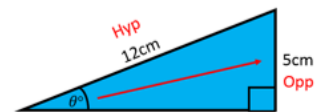
$$x = 6\text{cm}$$



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

$$\text{hypotenuse} = \frac{28}{\sin 53^\circ}$$

$$x = 35.06\text{cm}$$



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

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

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

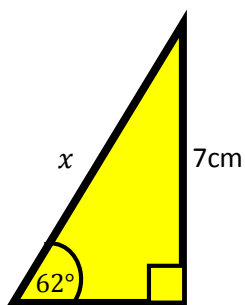
$$\theta^\circ = \sin^{-1}(0.416666\dots)$$

$$\theta = 24.6^\circ$$

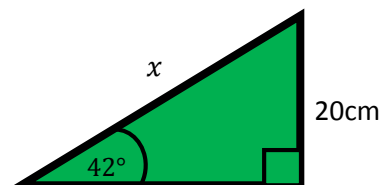
Consolidation 1

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

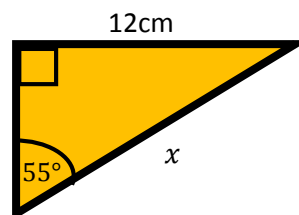
1.



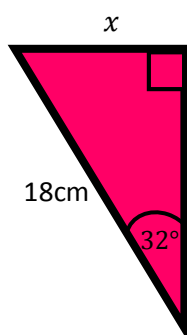
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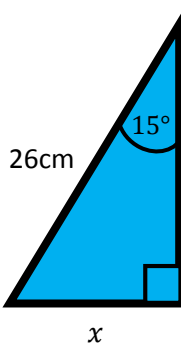
3.



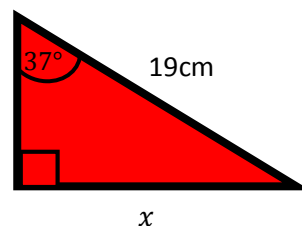
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5.

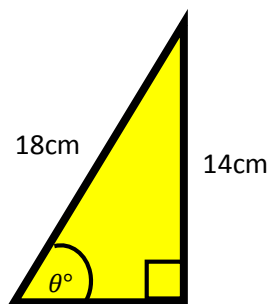


6.

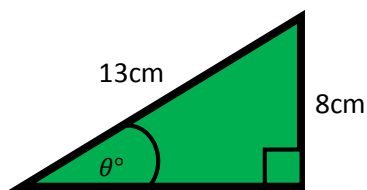


In each of these questions find the size of the angle marked θ to 1 decimal place.

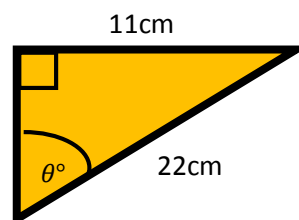
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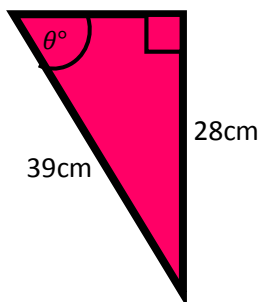
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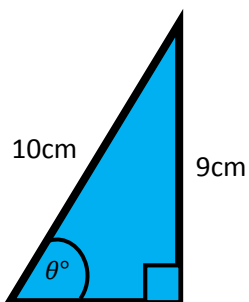
9.



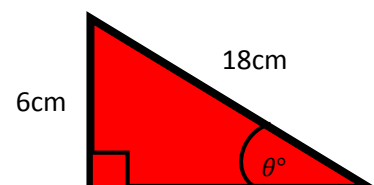
10.



11.

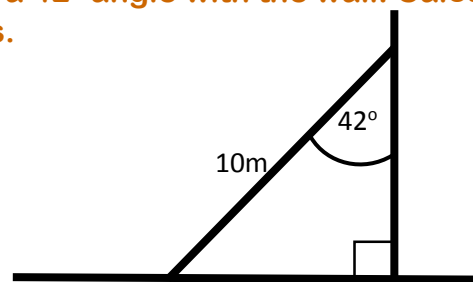


12.

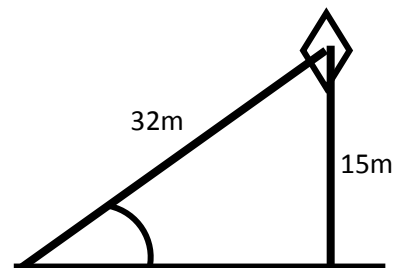


Extension 1

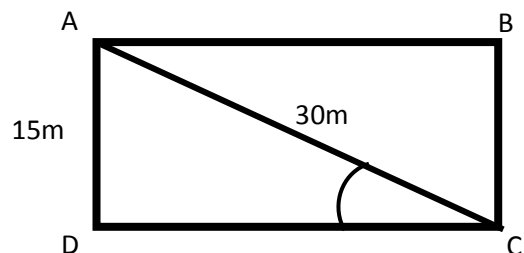
1. A 10m ladder is placed against a wall making a 42° angle with the wall. Calculate how far from the wall the base of the ladder is.



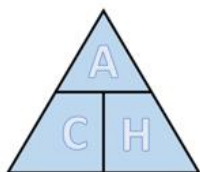
2. A boy is flying a kite in the park. He has let out 32m of string when he gets it stuck around a lamppost. The boy knows the lamppost is 15m high. What angle has the string made with the ground?



3. ABCD is a rectangular garden. The garden is 15m long and its diagonal is 30m. Work out the size of angle ACD.



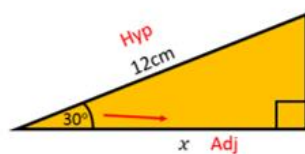
Using Cosine



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

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

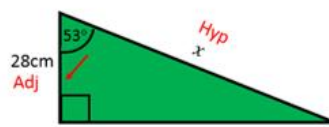
$$\text{hypotenuse} = \frac{\text{adjacent}}{\cos\theta^\circ}$$



$$\text{adjacent} = \cos 30^\circ \times \text{hypotenuse}$$

$$\text{adjacent} = \cos 30^\circ \times 12$$

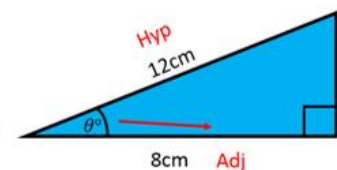
$$x = 10.4\text{cm}$$



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

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

$$x = 46.5\text{cm}$$



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

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

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

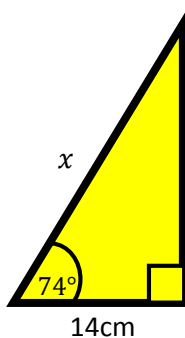
$$\theta^\circ = \cos^{-1}(0.666666\dots)$$

$$\theta = 48.2^\circ$$

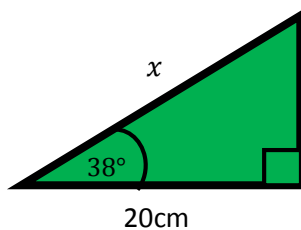
Consolidation 2

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

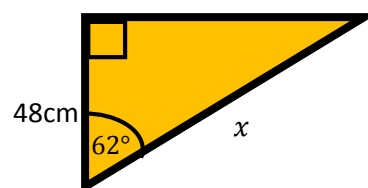
1.



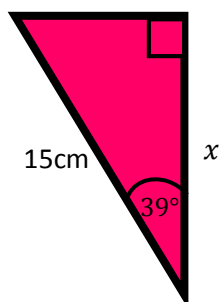
2.



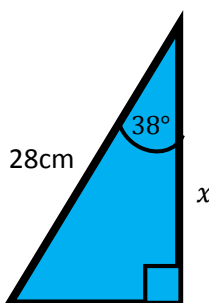
3.



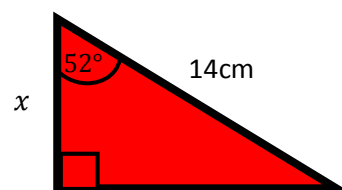
4.



5.

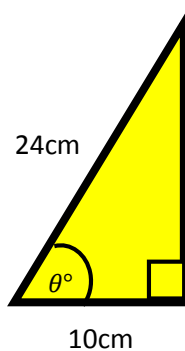


6.

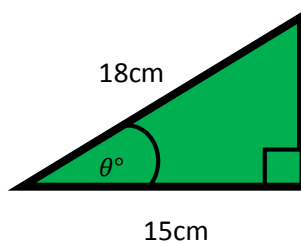


In each of these questions find the size of the angle marked θ to 1 decimal place.

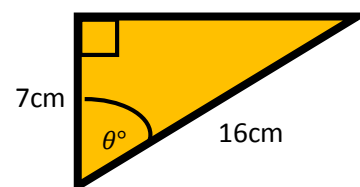
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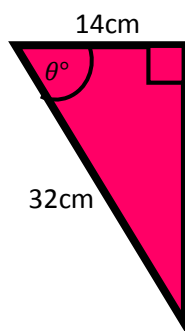
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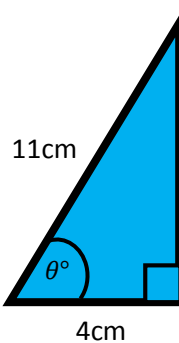
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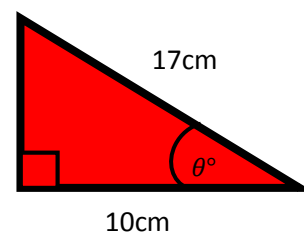
10.



11.

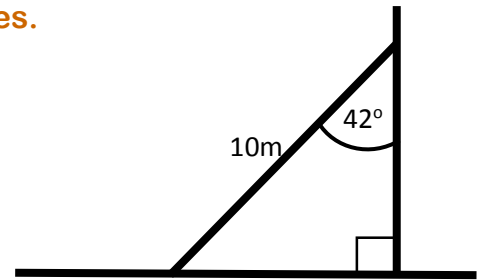


12.

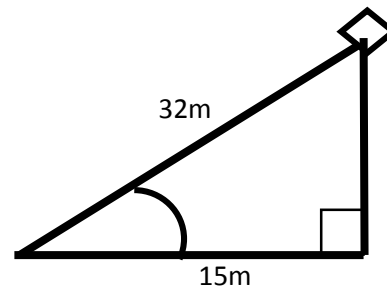


Extension 2

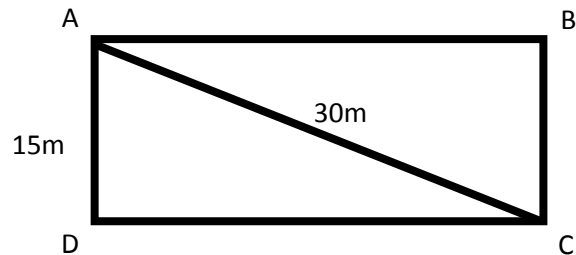
1. A 10m ladder is placed against a wall making a 42° angle with the wall. Calculate how high up the wall the ladder reaches.



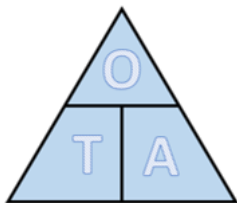
2. A boy is flying a kite in the park. He has let out 32m of string when he gets it stuck around a lamppost. The boy is 15m away from the lamppost. What angle does the string make with the ground?



4. ABCD is a rectangular garden. The garden is 15m long and its diagonal is 30m. Work out the size of angle ACD and use this to work out the width of the garden.



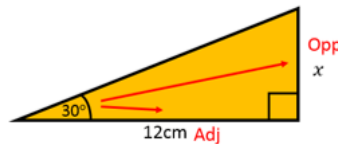
Using Tangent



$$\tan \theta^\circ = \frac{\text{opposite}}{\text{adjacent}}$$

$$\text{opposite} = \tan \theta^\circ \times \text{adjacent}$$

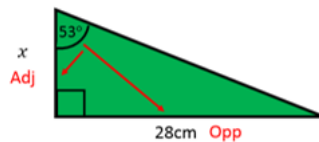
$$\text{adjacent} = \frac{\text{opposite}}{\tan \theta^\circ}$$



$$\text{opposite} = \tan \theta^\circ \times \text{adjacent}$$

$$\text{opposite} = \tan 30^\circ \times 12$$

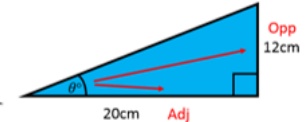
$$x = 6.9\text{cm}$$



$$\text{adjacent} = \frac{\text{opposite}}{\tan \theta^\circ}$$

$$\text{adjacent} = \frac{28}{\tan 53^\circ}$$

$$x = 21.1\text{cm}$$



$$\tan \theta^\circ = \frac{\text{opposite}}{\text{adjacent}}$$

$$\tan \theta^\circ = \frac{12}{20}$$

$$\tan \theta^\circ = 0.6$$

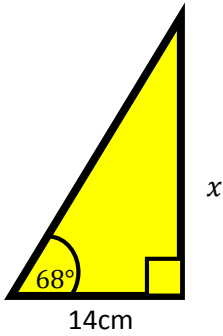
$$\theta^\circ = \tan^{-1}(0.6)$$

$$\theta = 31.0^\circ$$

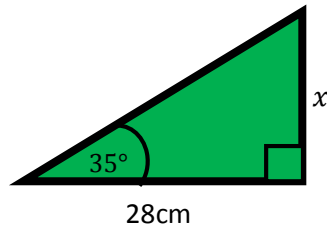
Consolidation 3

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

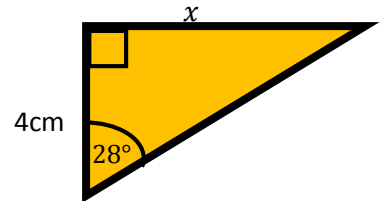
1.



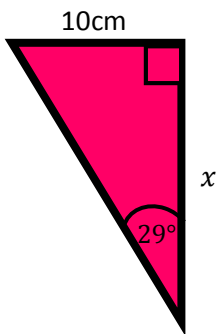
2.



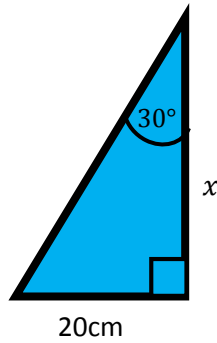
3.



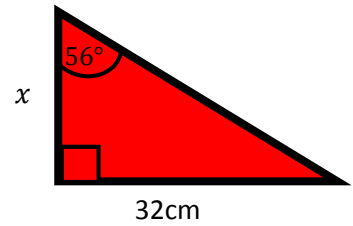
4.



5.

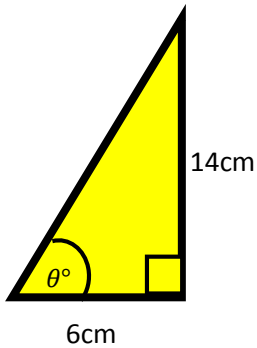


6.

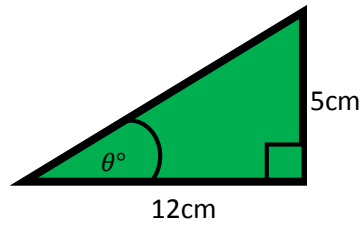


In each of these questions find the size of the angle marked θ to 1 decimal place.

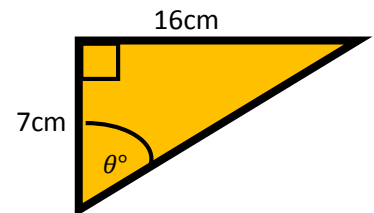
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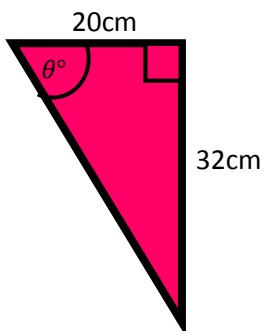
8.



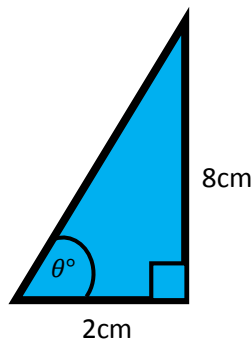
9.



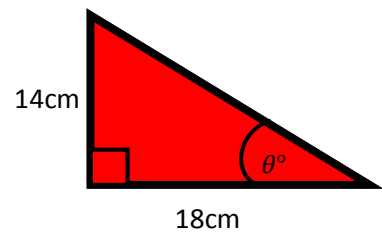
10.



11.

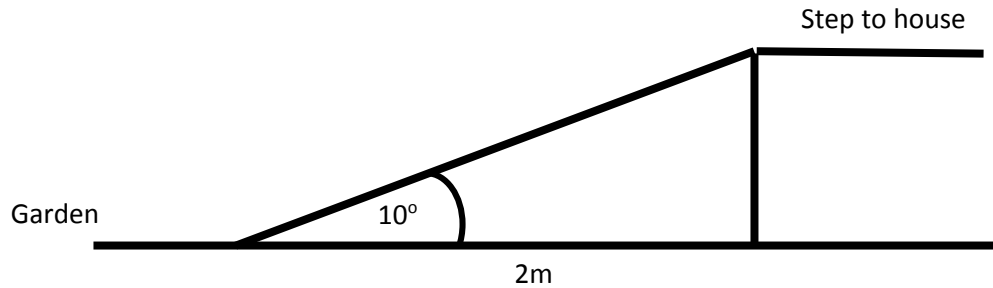


12.

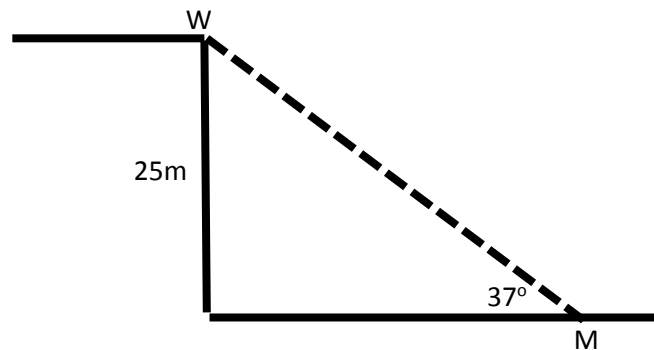


Extension 3

1. An access ramp is needed to get up the step of a person's house. The ramp makes an angle of 10° with the horizontal of the garden and is 2m away from the base of the step. Calculate the height of the ramp.

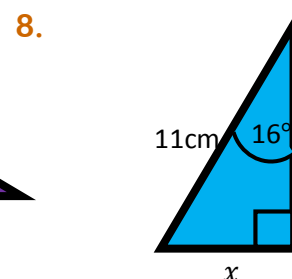
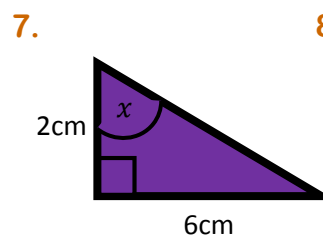
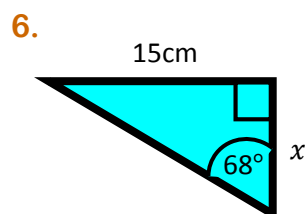
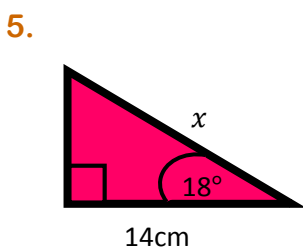
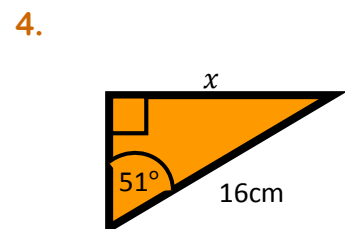
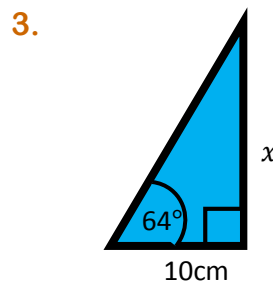
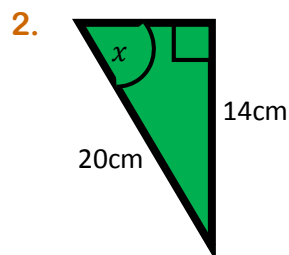
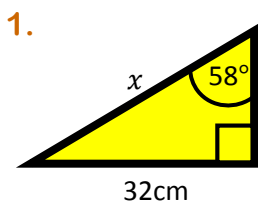


2. A man stands on the beach facing towards a cliff. At the top of the cliff the man sees his wife. The angle of elevation from the man to his wife is 37° . The height of the cliff is 28m. Find the distance between the man and the base of the cliff.



Which One?

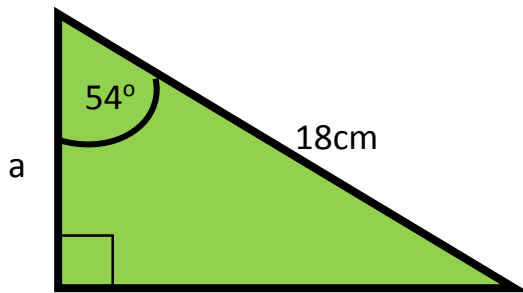
Write down which trig formula you would use to work out x in each of these:



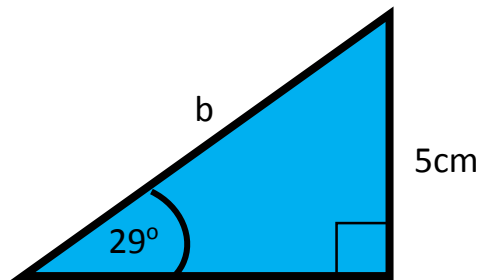
Mixed Practise

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

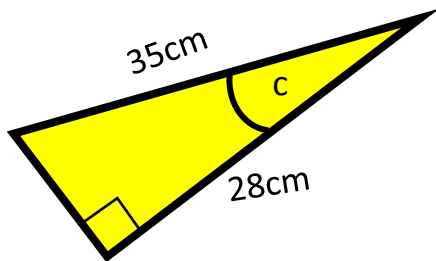
1)



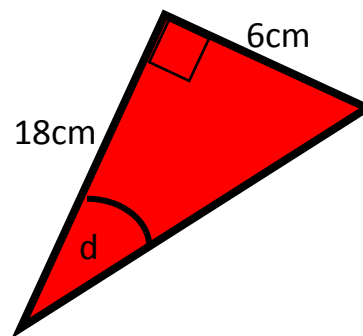
2)



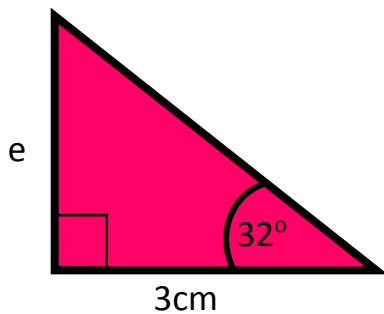
3)



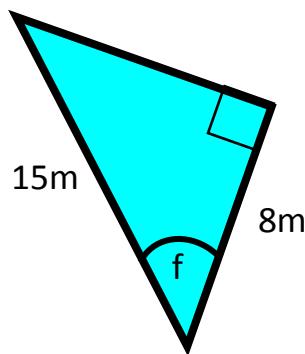
4)



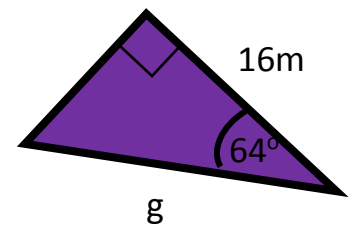
5)



6)



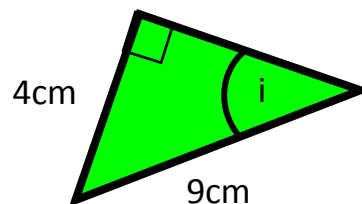
7)



8)



9)



10)

