Using Trigonometry

Calculating unknown angles

If you know the sin, cos or tan of an angle then to find the angle you need to use the inverse functions: sin^{-1} , cos^{-1} or tan^{-1}

Example 1.	lf	$\sin(\theta) = 0.6$
	Then	$\theta = \sin^{-1}(0.6)$
		= 36.87°

Use the calculator for this. You will need to use the SHIFT button or the 2nd button to access the small writing above the calculator buttons.



Recall



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When you start with a diagram you will need to use the method below

- 1. Choose which formula to use (sin, cos or tan).
- 2. Substitute in the values you have.
- 3. Solve using algebra skills.

Example 4



1. We have the *adjacent* and the *opposite* sides so we use

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

- 2. Substitute in the values $\tan(\theta) = \frac{4}{10} = 0.4$
- 3. Solve $\theta = \tan^{-1}(0.4)$

= 21.80°

Answer is $\theta = 21.80^{\circ}$

Example 5



- 1. We have the side *opposite* θ and the *hypotenuse* so we use $\sin \theta = \frac{\text{opp}}{\text{hyp}}$
- 2. Substitute in the values

$$\sin(\theta) = \frac{8}{12}$$

3. Solve

$$\sin^{-1}\left(\frac{8}{12}\right) = 41.81$$
$$\theta = 41.81^{\circ}$$

NB. This time we left $\frac{8}{12}$ as a fraction. If we converted it to a decimal we would need to either keep lots of decimal places, or round it and loose accuracy. It is easier to leave it as a fraction. The fraction can easily be put into your calculator.



