

# 1.4 Finding Angles

Wednesday, June 15, 2022 1:14 PM

## 1.4 Calculating Angles

So far, we have used the trigonometric formulas to determine the length of a side of a right triangle.

$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}} \quad \cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}} \quad \tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

We can also rewrite the trig formulas in terms of an acute angle ( $\theta$ ) using the following operations:

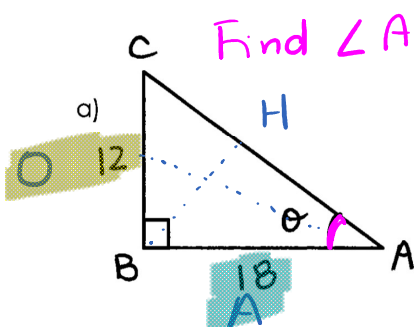
$$\sin^{-1} \quad \cos^{-1} \quad \tan^{-1} \quad \text{or 2nd sin 2nd cos 2nd tan}$$

(depending on your calculator). These operations are known as the inverse of sine, cosine and tangent.

Finding The Angle

$$\theta = \sin^{-1}\left(\frac{O}{H}\right) \quad \theta = \cos^{-1}\left(\frac{A}{H}\right) \quad \theta = \tan^{-1}\left(\frac{O}{A}\right)$$

**EXAMPLE 1** : Find the measure of the indicated angle, to the nearest degree.



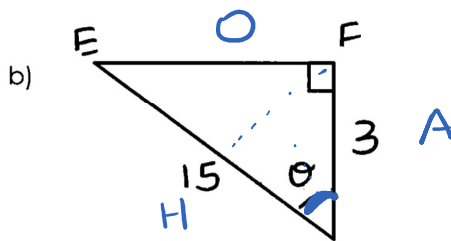
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$$\theta = \tan^{-1}\left(\frac{O}{A}\right)$$

$$\theta = \tan^{-1}\left(\frac{12}{18}\right)$$

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

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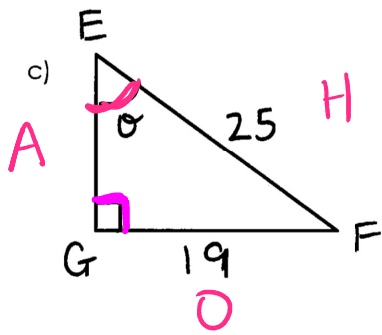
$$\theta = \cos^{-1}\left(\frac{A}{H}\right)$$

$$\theta = \cos^{-1}\left(\frac{3}{15}\right)$$

$$\theta = \cos^{-1}(0.2)$$

$$\theta = 78^\circ$$

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$$\theta = \sin^{-1}\left(\frac{O}{H}\right)$$

$$\theta = \sin^{-1}\left(\frac{19}{25}\right)$$

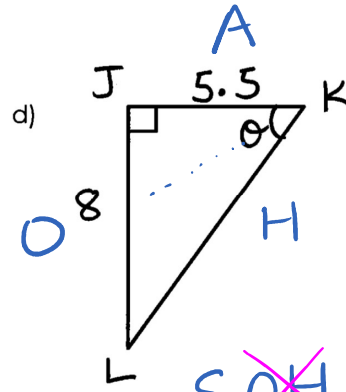
$$\theta = \sin^{-1}(0.76)$$

$$\theta = 49^\circ$$

$$E = 49^\circ$$

$$F = 180^\circ - 90^\circ - 49^\circ$$

$$F = 41^\circ$$



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$$\theta = \tan^{-1}\left(\frac{O}{A}\right)$$

$$\theta = \tan^{-1}\left(\frac{8}{5.5}\right)$$

$$\theta = \tan^{-1}(1.4545)$$

$$\theta = 55^\circ$$

Practice: p.75 #5ab, 10cd; p.95 #8, 10ab, 12

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