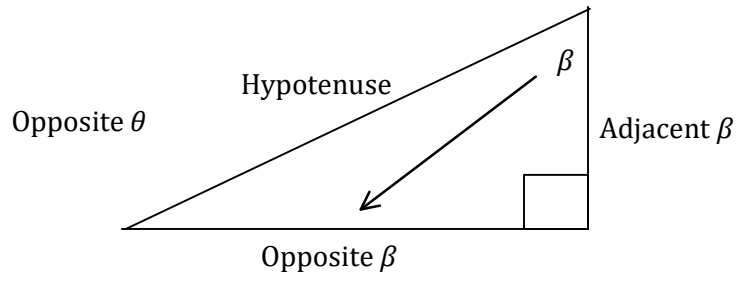
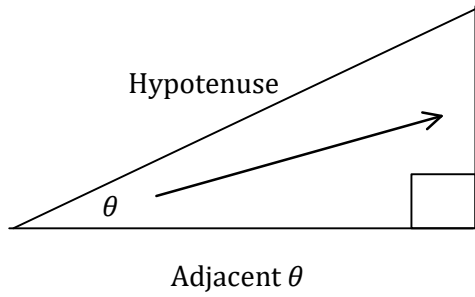


Sides $(\theta \ \& \ \beta \ \text{are Angles})$

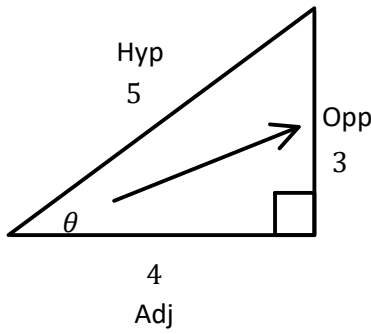


Hypotenuse: The Longest Side, Opposite of the 90° Angle.

Adjacent: The side touching angle θ .

Opposite: The side opposite of angle θ .

Sine Ratio



Label Hyp/Opp/Adj

1

$$\sin\theta = \frac{\text{Opposite}}{\text{Hypotenuse}}$$

$$\sin\theta = \frac{\text{opp}}{\text{hyp}}$$

$$\sin\theta = \frac{O}{H}$$

$$\sin\theta = \frac{O}{H}$$

Find an Angle

Calculator Degree Mode!
(Not Radians)
Mode Degree

$$\sin\theta = \frac{3}{5}$$

$$\sin\theta = 0.6$$



$$\sin\theta = \frac{3}{5}$$

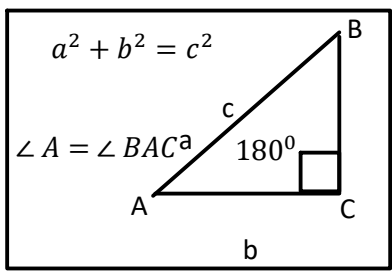
$$\theta = \sin^{-1}(0.6)$$

$$\theta = 36.9^\circ$$

SOH CAH TOA

I	O	H	O	A	H	A	O	A
N	P	Y	S	D	Y	N	P	D
E	P	P		J	P		P	J
	O	O		A	O		O	A
	S	T		C	T		S	C
	I	E		E	E		I	E
	T	N		N	N		T	N
	E	U		T	U		E	T
		S			S			
		E			E			

Choose the part of **SOH CAH TOA** that has 2 pieces of info that we have, and one we want.



Cosine Ratio

$$\cos\theta = \frac{\text{Adjacent}}{\text{Hypotenuse}}$$

$$\cos\theta = \frac{A}{H}$$

$$\cos\theta = \frac{4}{5}$$

$$\cos\theta = 0.8$$

$$\theta = \cos^{-1}(0.8)$$

$$\theta = 36.9^\circ$$

Tangent Ratio

$$\tan\theta = \frac{\text{Opposite}}{\text{Adjacent}}$$

$$\tan\theta = \frac{O}{A}$$

$$\tan\theta = \frac{3}{4}$$

$$\tan\theta = 0.75$$

$$\theta = \tan^{-1}(0.75)$$

$$\theta = 36.9^\circ$$

Measure the angle with a protractor!

M10 - 3.2 - SOH CAH TOA Trigonometry Algebra Notes

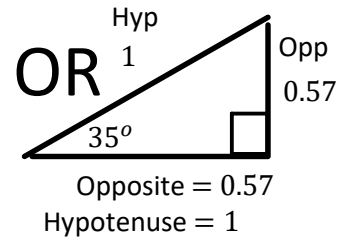
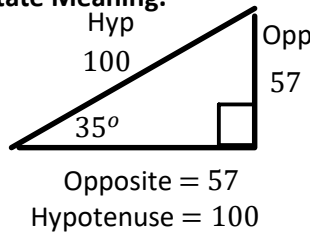
Plug into your Calculator, Draw a Triangle, State Meaning.

$$\sin 35 = 0.57$$

sin 35 Calculator Buttons

$$\frac{0.57}{1} = \frac{57}{100}$$

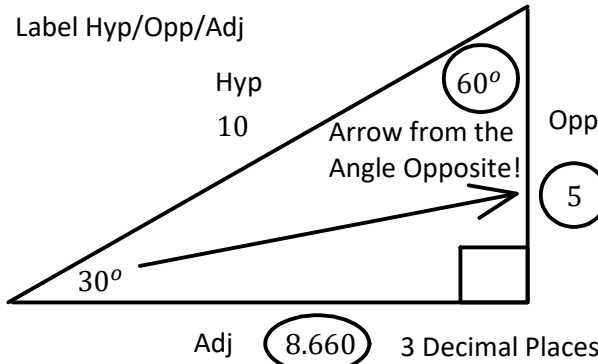
A Right Triangle with an angle of 35° has a ratio of:



Solve the Triangle Using Trigonometry

Solve the Opposite

Label Hyp/Opp/Adj



$$\sin \theta = \frac{Opp}{Hyp}$$

$$\sin 30 = \frac{Opp}{10}$$

$$10 \times \sin 30 = \frac{Opp}{10} \times 10$$

$$5 = Opp$$

Formula

Substitute

Angle/Hypotenuse

× 10 Both Sides

Cross it Off

Calculator Buttons

10 sin 30

$$\sin \theta = \frac{Opp}{Hyp}$$

$$\sin 30 = \frac{5}{10}$$

$$0.5 = \frac{1}{2}$$

Check Answer

Formula

Substitute

Left = Right

Check Mark

Algebra Review

$$2 = \frac{6}{A}$$

$$A \times 2 = \frac{6}{A} \times A$$

$$2A = \frac{6}{A}$$

$$\frac{2A}{2} = \frac{6}{2}$$

$$A = \frac{6}{2}$$

Multiply A
Divide 2
Both Sides

$$A = 3$$

$$2 = \frac{6}{A}$$

$$A = \frac{6}{2}$$

$$A = 3$$

Cross Multiply
Switch A and 2

Pythagoras

$$a^2 + b^2 = c^2$$

$$5^2 + b^2 = 10^2$$

$$25 + b^2 = 100$$

$$-25 \quad -25$$

$$b^2 = 75$$

$$\sqrt{b^2} = \sqrt{75}$$

$$b = 8.66$$

Measure the Angle with a Protractor!
Measure Hypotenuse Double Opposite!

180° in a Triangle

$$180^\circ = \angle a + \angle b + \angle c$$

$$\angle a = 180^\circ - 90^\circ - 30^\circ$$

$$\angle a = 90^\circ - 30^\circ$$

$$\angle a = 60^\circ$$

$$90^\circ - \theta$$

Solve the Adjacent

Using Tan

$$\tan \theta = \frac{Opp}{Adj}$$

$$\tan 30 = \frac{5}{A}$$

$$A \times \tan 30 = \frac{5}{A} \times A$$

$$A \tan 30 = 5$$

$$\frac{A \tan 30}{\tan 30} = \frac{5}{\tan 30}$$

$$A = \frac{5}{\tan 30}$$

$$A = 8.660$$

Multiply 5
Divide $\tan 30$
Both Sides!

OR

Cross Multiply

$$\tan 30 = \frac{5}{A}$$

$$A = \frac{5}{\tan 30}$$

$$A = 8.660$$

Using Cos

$$\cos \theta = \frac{Adj}{Hyp}$$

$$10 \times \cos 30 = \frac{Adj}{10} \times 10$$

$$Adj = 8.660$$

Calculator Buttons

5 ÷ tan 30

Find Other Angle β

Opp and Adj Switch

$$\cos \beta = \frac{Adj}{Hyp}$$

$$\cos \beta = \frac{5}{10}$$

$$\beta = \cos^{-1} \left(\frac{5}{10} \right)$$

$$\beta = 60^\circ$$

