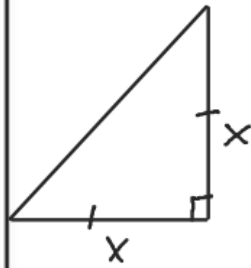
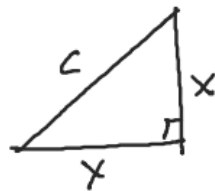


### 45-45-90 Triangle



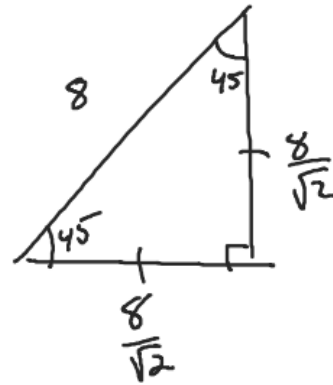
- Both Legs are the same length
- Hypotenuse is leg times  $\sqrt{2}$

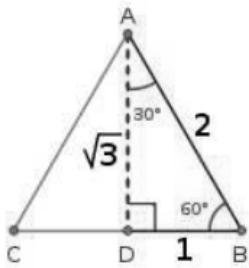


$$x^2 + x^2 = c^2$$

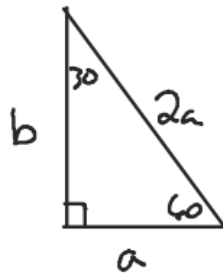
$$\sqrt{2x^2} = \sqrt{c^2}$$

$$x\sqrt{2}$$





### 30-60-90 Triangle



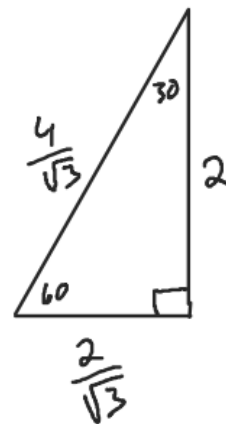
- Hypotenuse = 2 times short leg
- Long Leg  $\rightarrow$  Short Leg times  $\sqrt{3}$

$$a^2 + b^2 = (2a)^2$$

$$a^2 + b^2 = 4a^2$$

$$b^2 = 3a^2$$

$$b = a\sqrt{3}$$



$$\frac{2}{\sqrt{3}} \cdot \frac{2}{1} = \frac{4}{\sqrt{3}}$$

Evaluate using a calculator. Make sure your calculator is in the correct mode. Give answers to 3 decimal places and then draw the triangle that represents the situation.

A)  $\sin 53^\circ$

B)  $\cos \frac{2\pi}{5}$

C)  $\tan 154^\circ$

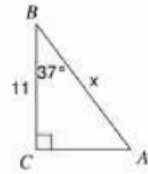
D)  $\cot \frac{\pi}{9}$

E)  $\csc 220^\circ$

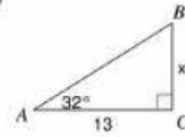
F)  $\sec \frac{8\pi}{5}$

Solve the triangle for the variable shown.

9)



10)



Solve the triangle ABC for all of its unknown parts. Assume C is the right angle.

$$\alpha = 40^\circ \quad a = 10$$

Solve the triangle ABC for all of its unknown parts. Assume C is the right angle.

$$\beta = 62^\circ \quad a = 7$$

Example 6: From a point 340 feet away from the base of the Peachtree Center Plaza in Atlanta, Georgia, the angle of elevation to the top of the building is  $65^\circ$ . Find the height of the building.

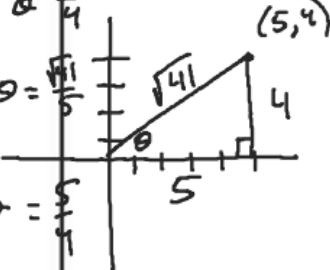
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What you'll Learn About

- Trig functions of any angle/Trig functions of real numbers
- Periodic Functions/The Unit Circle

Point P is on the terminal side of angle  $\theta$ . Evaluate the six trigonometric functions for  $\theta$ .

A) (5, 4)

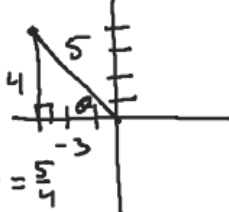


$$\sin \theta = \frac{4}{\sqrt{41}} \quad \csc \theta = \frac{\sqrt{41}}{4}$$

$$\cos \theta = \frac{5}{\sqrt{41}} \quad \sec \theta = \frac{\sqrt{41}}{5}$$

$$\tan \theta = \frac{4}{5} \quad \cot \theta = \frac{5}{4}$$

B) (-3, 4)

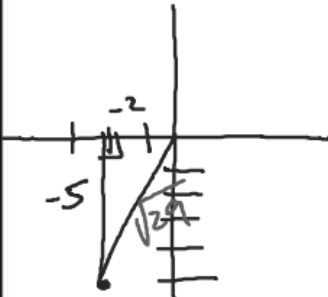


$$\sin \theta = \frac{4}{5} \quad \csc \theta = \frac{5}{4}$$

$$\cos \theta = -\frac{3}{5} \quad \sec \theta = -\frac{5}{3}$$

$$\tan \theta = -\frac{4}{3} \quad \cot \theta = -\frac{3}{4}$$

C) (-2, -5)

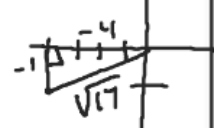


$$\sin \theta = -\frac{5}{\sqrt{29}} \quad \csc \theta = -\frac{\sqrt{29}}{5}$$

$$\cos \theta = -\frac{2}{\sqrt{29}} \quad \sec \theta = -\frac{\sqrt{29}}{2}$$

$$\tan \theta = \frac{5}{2} \quad \cot \theta = \frac{2}{5}$$

D) (-4, -1)

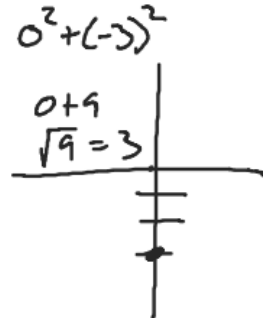


$$\sin \theta = -\frac{1}{\sqrt{17}} \quad \csc \theta = -\sqrt{17}$$

$$\cos \theta = -\frac{4}{\sqrt{17}} \quad \sec \theta = -\frac{\sqrt{17}}{4}$$

$$\tan \theta = \frac{1}{4} \quad \cot \theta = 4$$

E) (0, -3)  $r=3$

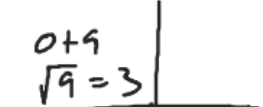


$$\sin \theta = \frac{-3}{3} = -1 \quad \csc \theta = -1$$

$$\cos \theta = \frac{0}{3} = 0 \quad \sec \theta = \text{undefined}$$

$$\tan \theta = \frac{-3}{0} = \text{undefined} \quad \cot \theta = 0$$

F) (3, 0)  $r=3$



$$\sin \theta = 0 \quad \csc \theta = \text{und.}$$

$$\cos \theta = 1 \quad \sec \theta = 1$$

$$\tan \theta = 0 \quad \cot \theta = \text{und.}$$

$\sin$ $(-,+)$	$All$ $(+,+)$	Determine the sign (+ or -) of the given value without the use of a calculator. A) $\sin 53^\circ$ $+$	B) $\cos \frac{2\pi}{5}$ $+$
$(-, -)$ $\tan$	$(+, -)$ $\cos$	C) $\tan 154^\circ$ $-$	D) $\cot \frac{\pi}{9}$ $+$
		E) $\csc 220^\circ$ $-$	F) $\sec \frac{8\pi}{5}$ $+$



# Unit Circle, Fill in the blank

