

9-2 Trig Review

Objectives:

- I can find the trigonometric functions of acute angles.
- I can identify reciprocal functions

Trig Functions

SohCahToa

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

cosine $\cos \theta = \frac{\text{adj}}{\text{hyp}}$

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

reciprocal

cosecant $\csc \theta = \frac{\text{hyp}}{\text{opp}}$

secant $\sec \theta = \frac{\text{hyp}}{\text{adj}}$

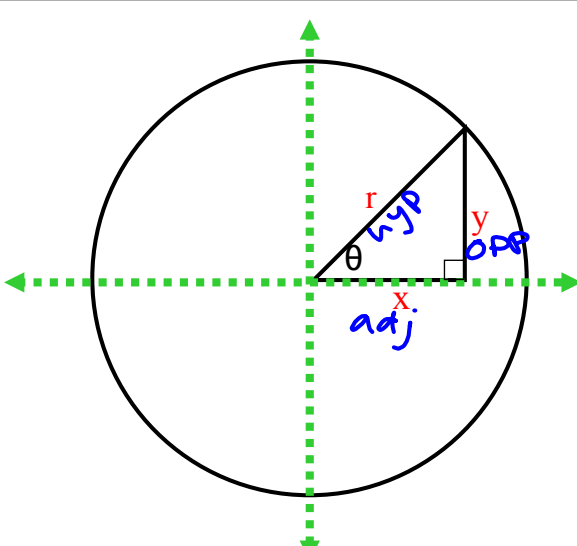
cotangent $\cot \theta = \frac{\text{adj}}{\text{opp}}$

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

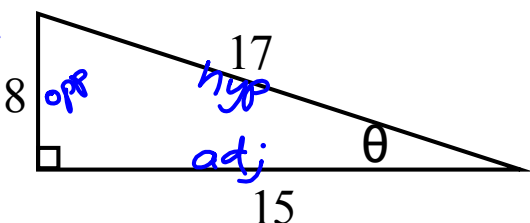
$$\cos \theta = \frac{\text{adj}}{\text{hyp}} = \frac{x}{r}$$

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

$$\sec \theta = \frac{\text{hyp}}{\text{adj}} = \frac{r}{x} \quad \csc \theta = \frac{\text{hyp}}{\text{opp}} = \frac{r}{y} \quad \cot \theta = \frac{\text{adj}}{\text{opp}} = \frac{x}{y}$$

$$\sec \theta = \frac{1}{\cos \theta} \quad \csc \theta = \frac{1}{\sin \theta} \quad \frac{1}{\tan \theta}$$


Sohcahtoa



Find all six trig ratios for the given triangle:

$$\sin \theta = \frac{8}{17} \quad \csc \theta = \frac{17}{8}$$

$$\cos \theta = \frac{15}{17} \quad \sec \theta = \frac{17}{15}$$

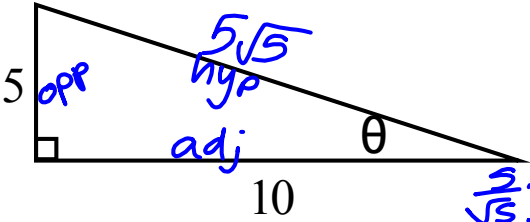
$$\tan \theta = \frac{8}{15} \quad \cot \theta = \frac{15}{8}$$

$\theta = \text{theta}$

$$5^2 + 10^2 = c^2$$

$$+ \sqrt{25} = \sqrt{c^2}$$

$$\sqrt{25} = 5$$



$$\frac{5}{5\sqrt{5}} = \frac{1}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5}$$

$$\frac{10}{5\sqrt{5}} = \frac{2}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$$

$$\frac{5}{10} = \frac{1}{2}$$

$$\frac{5}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{5\sqrt{5}}{5} = \sqrt{5}$$

$$\frac{5}{2}$$

$$2$$

Find all six trig ratios for the given triangle:

$\sin \theta = \frac{5}{5\sqrt{5}} = \frac{1}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5}$
 $\csc \theta = \sqrt{5}$

$\cos \theta = \frac{10}{5\sqrt{5}} = \frac{2}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$
 $\sec \theta = \frac{\sqrt{5}}{2}$

$\tan \theta = \frac{5}{10} = \frac{1}{2}$
 $\cot \theta = 2$

Given the following trig function, find the remaining 5 functions:

$\csc \theta = \frac{13}{5}$
 $\sin \theta = \frac{5}{13}$

$\sec \theta = \frac{13}{12}$
 $\cos \theta = \frac{12}{13}$

$\cot \theta = \frac{12}{5}$
 $\tan \theta = \frac{5}{12}$

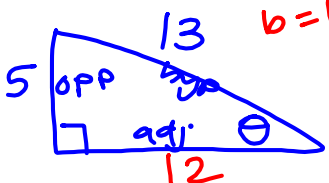
$$5^2 + b^2 = 13^2$$

$$25 + b^2 = 169$$

$$-25 \quad -25$$

$$b^2 = 144$$

$$b = 12$$



Given the following trig function, find the remaining 5 functions:

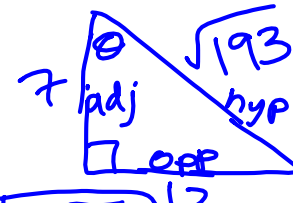
$$\cot \theta = \frac{7}{12} \quad \tan \theta = \frac{12}{7}$$


Diagram: A right-angled triangle with angle θ at the top vertex. The vertical leg (adjacent) is 7, the horizontal leg (opposite) is 12, and the hypotenuse is $\sqrt{193}$.

$$\sec \theta = \frac{\sqrt{193}}{7} \quad \cos \theta = \frac{7}{\sqrt{193}} = \frac{7\sqrt{193}}{193}$$

$$\csc \theta = \frac{\sqrt{193}}{12} \quad \sin \theta = \frac{12}{\sqrt{193}} = \frac{12\sqrt{193}}{193}$$

Using your calculator, find: $\cot \theta = \frac{1}{\tan \theta}$

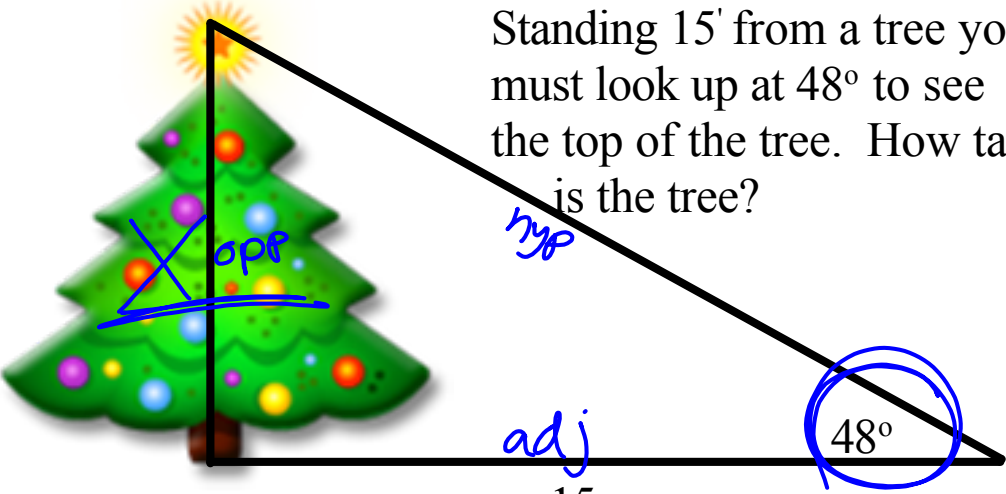
$$\tan 8^\circ = .14$$

$$\cot \frac{\pi}{12} = \frac{1}{\tan(\frac{\pi}{12})} = 3.73$$

$$\cos 18.15^\circ = .95$$

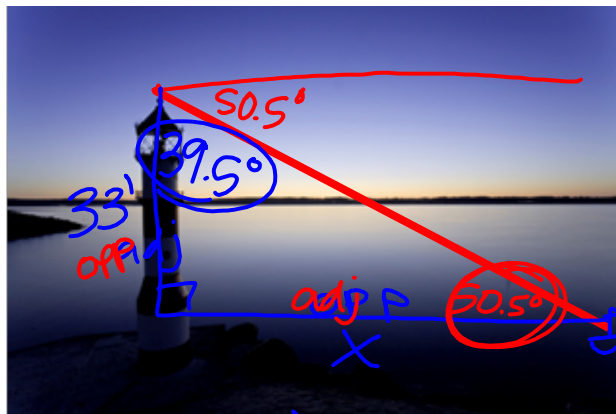
$$\tan 5.25 = -1.68$$

$$\sec \frac{\pi}{6} = \frac{1}{\cos(\frac{\pi}{6})} = 1.15$$



Standing 15' from a tree you must look up at 48° to see the top of the tree. How tall is the tree?

$$15(\tan 48^\circ) = \left(\frac{x}{15}\right) 15$$

$$x = 16.66 \text{ ft}$$


A bird sitting on a 33' tower looks at a boat from an angle of depression of 50.5° . How far is the boat from the tower?

$$33(\tan 39.5^\circ) = \frac{x}{33} \cdot 33$$

$$x = 27.2'$$

$$x(\tan 50.5^\circ) = \left(\frac{33}{x}\right) x$$

$$\frac{x \tan 50.5^\circ}{\tan 50.5^\circ} = -$$