4.2 Trig Functions

**SohCahToa**

sine \[ \sin \theta = \frac{\text{opp}}{\text{hyp}} = \frac{y}{r} \]

cosecant \[ \csc \theta = \frac{\text{hyp}}{\text{opp}} = \frac{r}{y} \]

cosine \[ \cos \theta = \frac{\text{adj}}{\text{hyp}} = \frac{x}{r} \]

secant \[ \sec \theta = \frac{\text{hyp}}{\text{adj}} = \frac{r}{x} \]

tangent \[ \tan \theta = \frac{\text{opp}}{\text{adj}} = \frac{y}{x} \]

cotangent \[ \cot \theta = \frac{\text{adj}}{\text{opp}} = \frac{x}{y} \]
Find all six trig ratios for the given triangle:

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Given the following trig function, find the remaining 5 functions:
\[
csc \theta = \frac{13}{5}
\]

Work on 3-18 (remember every third)

Using your calculator, find:
\[
\tan 8^\circ = \quad \cot \frac{\pi}{12} =
\]

\[
\cos 18.15^\circ = \quad \tan 5.25 =
\]

\[
\sec \frac{\pi}{6} =
\]
Standing 15’ from a tree you must look up at 48° to see the top of the tree. How tall is the tree?

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?
Special Triangles

Find the angle or value without a calculator:

\[ \cot \frac{\pi}{3} = \] \quad \sin \theta = \frac{\sqrt{3}}{2} \\

\[ \sec \frac{\pi}{6} = \] \quad \cos \theta = \frac{1}{2} \\

\[ \sec \theta = 2 \]
UNIT CIRCLE

$(\cos \theta, \sin \theta) \tan \theta$

(0, 1) undefined

$\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right) \sqrt{3}$

$\left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right) 1$

$\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right) \frac{\sqrt{3}}{3}$

$2\pi 0^\circ (1, 0) 0^\circ$