

SOH-CAH-TOA

13-1 Right Triangle Trigonometry

Day 1

Objective: Find values of Trig Function for acute angles.
Solve problems involving right triangles.

I. **Trigonometry:** The study of the relationships among the angles and sides of a right triangle.

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

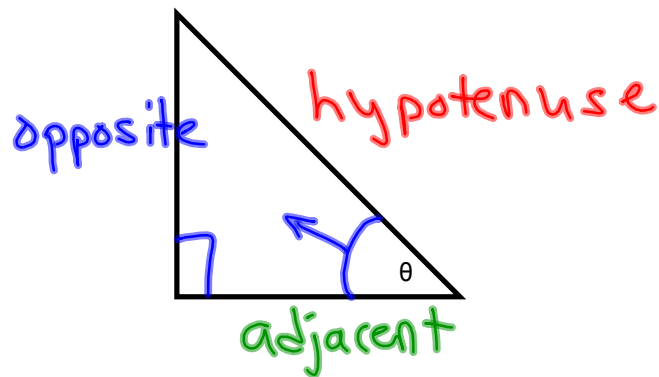
$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

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

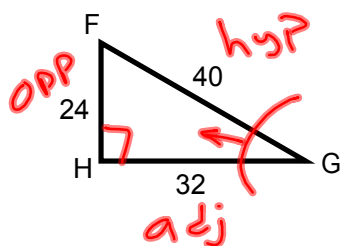
$$\csc \theta = \frac{\text{hyp}}{\text{opp}}$$

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

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



Ex 1) Find the values of the six trig functions for angle G.



$$\sin G = \frac{\text{opp}}{\text{hyp}} = \frac{24}{40} = \frac{3}{5}$$

$$\cos G = \frac{\text{adj}}{\text{hyp}} = \frac{32}{40} = \frac{4}{5}$$

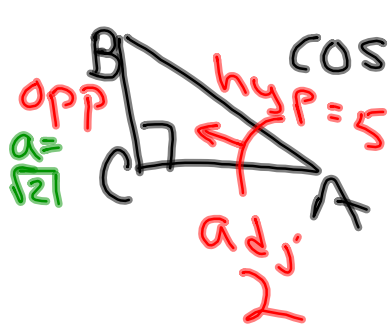
$$\tan G = \frac{\text{opp}}{\text{adj}} = \frac{24}{32} = \frac{3}{4}$$

$$\csc G = \frac{5}{3}$$

$$\sec G = \frac{5}{4}$$

$$\cot G = \frac{4}{3}$$

Ex 2) If $\cos A = 2/5$, find the value of $\tan A$.



$$\cos A = \frac{2}{5} = \frac{\text{adj}}{\text{hyp}}$$

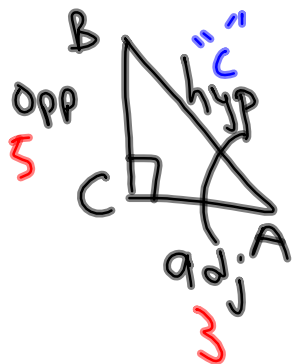
$$\tan A = \frac{\text{opp}}{\text{adj}} = \frac{\sqrt{21}}{2}$$

$$a^2 + 2^2 = 5^2$$

$$a^2 + 4 = 25$$

$$a^2 = 21 \quad a = \sqrt{21}$$

Ex 3) If $\tan A = 5/3$, find the value of $\csc A$.



$$\tan A = \frac{5}{3} = \frac{\text{opp}}{\text{adj}}$$

$$\csc A = \frac{\text{hyp}}{\text{opp}} = \frac{\sqrt{34}}{5}$$

$$5^2 + 3^2 = c^2$$

$$25 + 9 = c^2$$

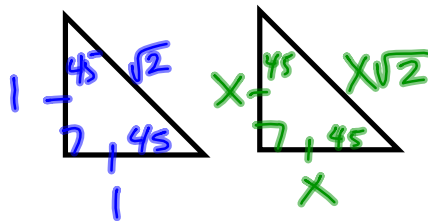
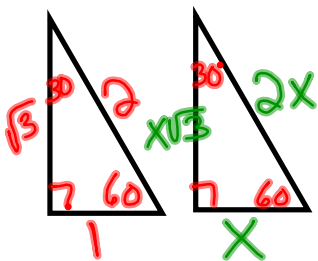
$$34 = c^2$$

$$\sqrt{34} = c$$

Special Right Triangles—page 703

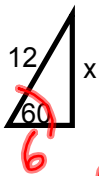
30-60-90

45-45-90



Find x. Round sides to the nearest tenth and angles to the nearest degree.

Ex 4)



2 ways

#1

$x = 6\sqrt{3}$
 $x = 10.4$

#2 (if not a special Δ)



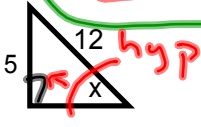
$12 \sin 60^\circ = \frac{x}{12} \cdot 12$

$12 \sin 60^\circ = x$

use calc

$10.4 = x$

Ex 5)



$\sin x = \frac{5}{12}$

$\sin^{-1}\left(\frac{5}{12}\right) = x$

$24.62 = x$

$25 = x$

*Use your inverse key to find angle measures!