

Solving Using Trig Ratios

Determining which ratio to use:

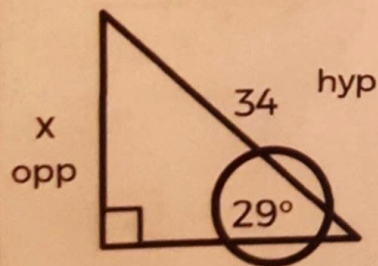
1. Circle the angle
2. Label the sides that are marked in reference to that angle
 - 3 possible pairings:
 - opp and hyp
 - adj and hyp
 - opp and adj
3. Choose the correct function based on the pairing

$$\sin = \frac{\text{opp}}{\text{hyp}} \quad \cos = \frac{\text{adj}}{\text{hyp}} \quad \tan = \frac{\text{opp}}{\text{adj}}$$

4. Set-up and solve your equation for the missing side or angle

$$\text{trig ratio (angle)} = \frac{\text{side}}{\text{side}}$$

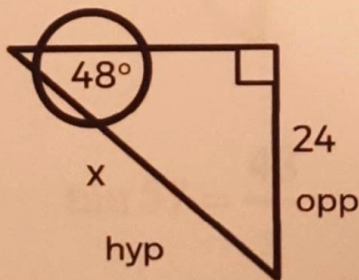
Using Sin:



$$\sin 29 = \frac{x}{34}$$

$$x = 34(\sin 29)$$

$$x = 16.5$$

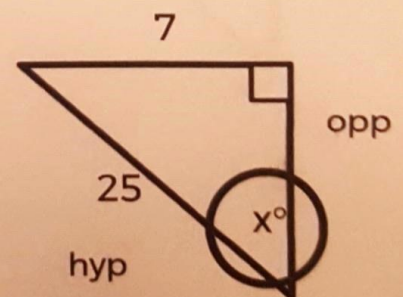


$$\sin 48 = \frac{24}{x}$$

$$x = \frac{24}{\sin 48}$$

$$x = 32.3$$

S-O-H



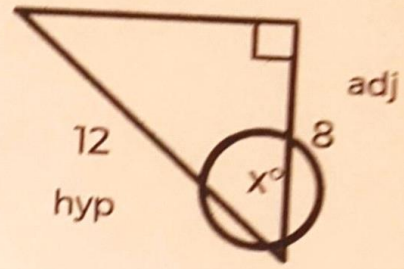
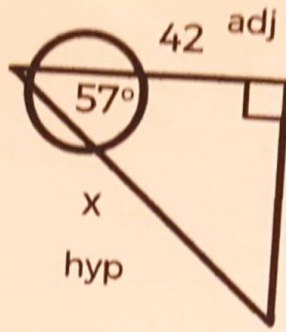
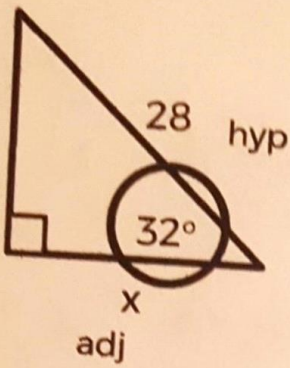
$$\sin x = \frac{7}{25}$$

$$\sin^{-1}\left(\frac{7}{25}\right)$$

$$x = 16.3^\circ$$

Using Cos:

C-A-



$$\cos 32 = \frac{x}{28}$$

$$x = 28(\cos 32)$$

$$x = 23.7$$

$$\cos 57 = \frac{42}{x}$$

$$x = \frac{42}{\cos 57}$$

$$x = 77.1$$

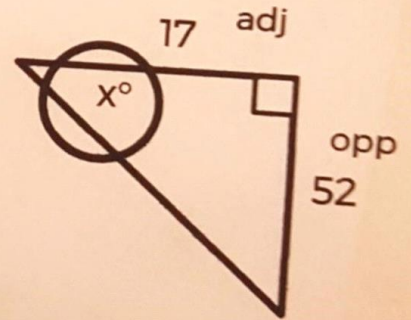
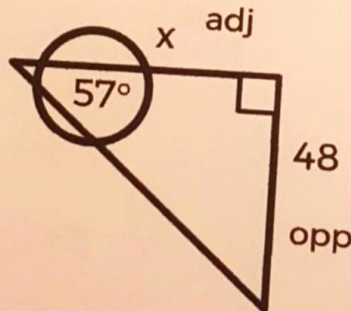
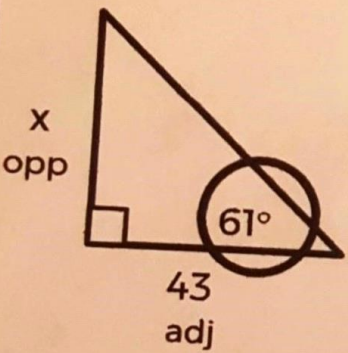
$$\cos x = \frac{8}{12}$$

$$\cos^{-1}\left(\frac{8}{12}\right)$$

$$x = 48.2^\circ$$

Using Tan:

T-O-A



$$\tan 61 = \frac{x}{43}$$

$$x = 43(\tan 61)$$

$$x = 77.6$$

$$\tan 57 = \frac{48}{x}$$

$$x = \frac{48}{\tan 57}$$

$$x = 31.2$$

$$\tan x = \frac{52}{17}$$

$$\tan^{-1}\left(\frac{52}{17}\right)$$

$$x = 71.9^\circ$$

Using Trig to Find Missing Sides HW

Find the missing side. Round to the nearest tenth.

1)

$\sin 53 = \frac{20}{x}$
 $\frac{\sin 53}{1} = \frac{20}{x}$
 $x \sin 53 = 20$
 $\frac{x \sin 53}{\sin 53} = \frac{20}{\sin 53}$
 $x = 25$

2)

$\sin 32 = \frac{x}{18}$
 $\frac{\sin 32}{1} = \frac{x}{18}$
 $x = 18 \sin 32$
 $x = 9.5$

3)

$\tan 63 = \frac{17}{x}$
 $\frac{\tan 63}{1} = \frac{17}{x}$
 $x \tan 63 = 17$
 $\frac{x \tan 63}{\tan 63} = \frac{17}{\tan 63}$
 $x = 8.7$

4)

$\sin 34 = \frac{16}{x}$
 $\frac{\sin 34}{1} = \frac{16}{x}$
 $x \sin 34 = 16$
 $\frac{x \sin 34}{\sin 34} = \frac{16}{\sin 34}$
 $x = 28.6$

5)

$\cos 72 = \frac{20}{x}$
 $\frac{\cos 72}{1} = \frac{20}{x}$
 $x \cos 72 = 20$
 $\frac{x \cos 72}{\cos 72} = \frac{20}{\cos 72}$
 $x = 64.7$

6)

$\cos 15 = \frac{15}{x}$
 $\frac{\cos 15}{1} = \frac{15}{x}$
 $x \cos 15 = 15$
 $\frac{x \cos 15}{\cos 15} = \frac{15}{\cos 15}$
 $x = 15.5$

7)

$\tan 38 = \frac{x}{17}$
 $\frac{\tan 38}{1} = \frac{x}{17}$
 $x = 17 \tan 38$
 $x = 13.3$

8)

$\sin 75 = \frac{16}{x}$
 $\frac{\sin 75}{1} = \frac{16}{x}$
 $x \sin 75 = 16$
 $\frac{x \sin 75}{\sin 75} = \frac{16}{\sin 75}$
 $x = 16.6$

9)

$\sin 22 = \frac{x}{13}$
 $\frac{\sin 22}{1} = \frac{x}{13}$
 $x = 13 \sin 22$
 $x = 4.9$

10)

$\tan 52 = \frac{10}{x}$
 $\frac{\tan 52}{1} = \frac{10}{x}$
 $x \tan 52 = 10$
 $\frac{x \tan 52}{\tan 52} = \frac{10}{\tan 52}$
 $x = 7.8$

11)

$\sin 34 = \frac{17}{x}$
 $\frac{\sin 34}{1} = \frac{17}{x}$
 $x \sin 34 = 17$
 $\frac{x \sin 34}{\sin 34} = \frac{17}{\sin 34}$
 $x = 30.40$

12)

$\tan 18 = \frac{x}{16}$
 $\frac{\tan 18}{1} = \frac{x}{16}$
 $x = 16 \tan 18$
 $x = 5.2$