

If subtraction undoes addition
 and....division undoes multiplication
 and... square roots undo squaring

what undoes a trig function?

Inverse Trig Functions

Find the value of the ANGLE x .
 Round your answer to the nearest tenth.

\sin^{-1} sine inverse
 $\frac{O}{H}$

\cos^{-1} cosine inverse
 $\frac{A}{H}$

\tan^{-1} tangent inverse
 $\frac{O}{A}$

**Use to find
 the ANGLE
 measures!**

Adj 6 X° 10 hyp
 opp 8

What undoes a trig Function?

$\sin(x) = \frac{8}{10}$
 $\sin^{-1}(\sin(x)) = \sin^{-1}(\frac{8}{10})$
 $x = \sin^{-1}(\frac{8}{10})$
 $x = 53.13^\circ$

$\cos(x) = \frac{6}{10}$
 $\cos^{-1}(\cos(x)) = \cos^{-1}(\frac{6}{10})$
 $x = \cos^{-1}(\frac{6}{10})$
 $x = 53.13^\circ$

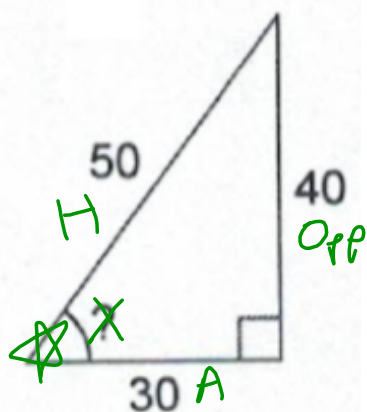
$\tan(x) = \frac{8}{6}$
 $\tan^{-1}(\tan(x)) = \tan^{-1}(\frac{8}{6})$
 $x = \tan^{-1}(\frac{8}{6})$
 $x = 53.13^\circ$

Inverses produce Angles!

Type in 2nd, sin for \sin^{-1}
2nd cos for \cos^{-1}
2nd tan for \tan^{-1}

Find the measure of the indicated angle to the nearest tenth of a degree.

1)



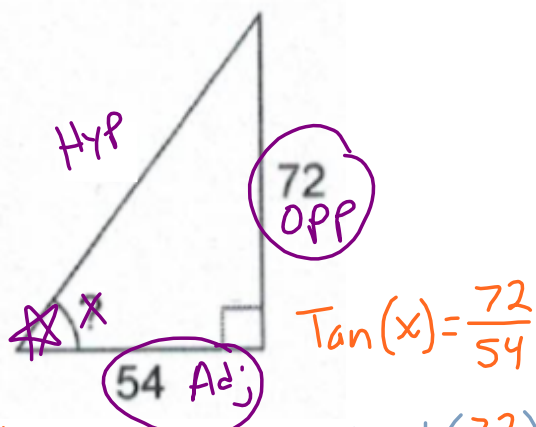
$$\sin(x) = \frac{40}{50} \quad \cos(x) = \frac{30}{50} \quad \tan(x) = \frac{40}{30}$$

$$x = \sin^{-1}\left(\frac{40}{50}\right) \quad x = \cos^{-1}\left(\frac{30}{50}\right) \quad x = \tan^{-1}\left(\frac{40}{30}\right)$$

$$x = 53.13^\circ$$

Similar triangle with 3-4-5 or ... 54-72-90
 6-8-10 3.18 4.18 5.18
 So same angle measure!

2)



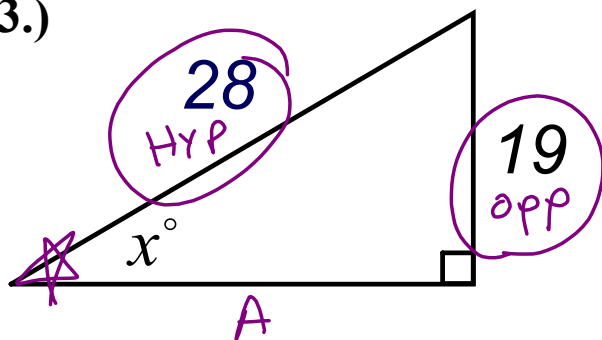
$$\tan(x) = \frac{72}{54}$$

$$x = \tan^{-1}\left(\frac{72}{54}\right)$$

$$x = 53.13^\circ$$

Unknown Angle

3.)

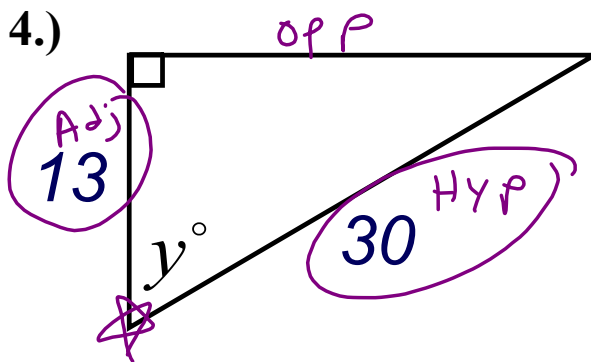


$$\sin(x) = \frac{19}{28}$$

$$x = \sin^{-1}\left(\frac{19}{28}\right)$$

$$x = 42.73^\circ$$

4.)



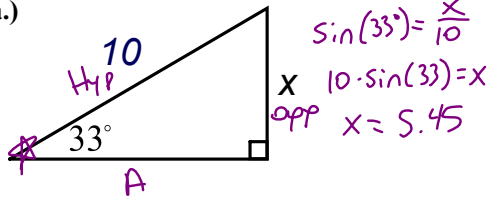
$$\cos(y) = \frac{13}{30}$$

$$y = \cos^{-1}\left(\frac{13}{30}\right)$$

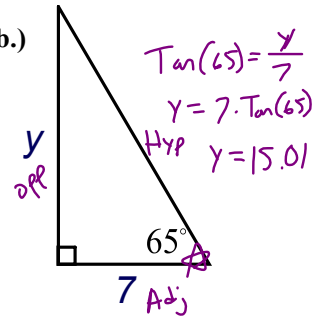
$$y = 64.32^\circ$$

5.) Unknown Side - Easier

a.)

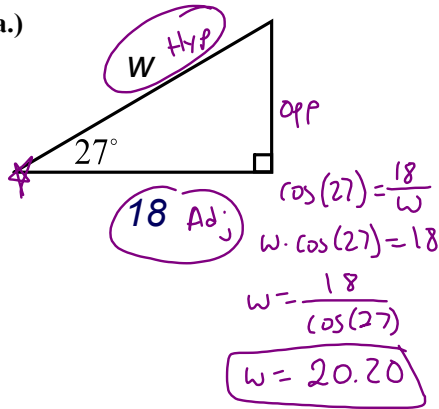


b.)

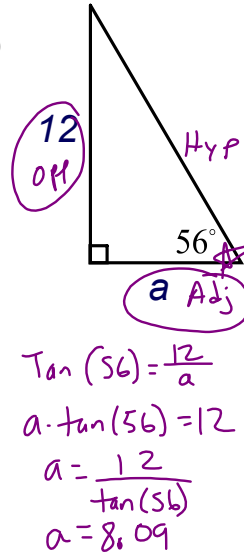


6.) Unknown Side - Harder

a.)



b.)



Find each angle measure to the nearest degree.

1) $\tan A = 2.0503$

$A = \tan^{-1}(2.0503)$
 $A = 64^\circ$

2) $\cos Z = 0.1219$

$Z = \cos^{-1}(0.1219)$
 $Z = 83^\circ$

3) $\tan Y = 0.6494$

$Y = \tan^{-1}(0.6494)$
 $Y = 33^\circ$

4) $\sin U = 0.8746$

$U = \sin^{-1}(0.8746)$
 $U = 61^\circ$

5) $\cos V = 0.6820$

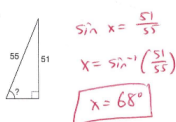
$V = \cos^{-1}(0.6820)$
 $V = 47^\circ$

6) $\sin C = 0.2756$

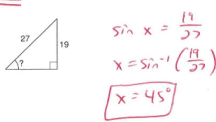
$C = \sin^{-1}(0.2756)$
 $C = 16^\circ$

Find the measure of the indicated angle to the nearest degree.

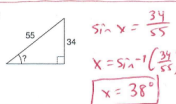
7)



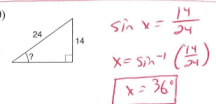
8)



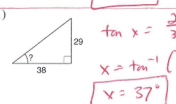
9)



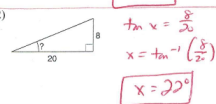
10)



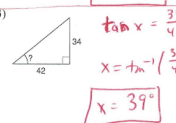
11)



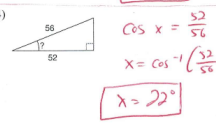
12)





13)





14)





15)  $\cos x = \frac{8}{17}$
 $x = \cos^{-1}\left(\frac{8}{17}\right)$
 $x = 62^\circ$


16)  $\cos x = \frac{13}{18}$
 $x = \cos^{-1}\left(\frac{13}{18}\right)$
 $x = 44^\circ$


17)  $\tan x = \frac{34}{39}$
 $x = \tan^{-1}\left(\frac{34}{39}\right)$
 $x = 41^\circ$

18)  $\sin x = \frac{51}{54}$
 $x = \sin^{-1}\left(\frac{51}{54}\right)$
 $x = 71^\circ$


19)  $\cos x = \frac{26}{45}$
 $x = \cos^{-1}\left(\frac{26}{45}\right)$
 $x = 55^\circ$


20)  $\sin x = \frac{16}{19}$
 $x = \sin^{-1}\left(\frac{16}{19}\right)$
 $x = 57^\circ$


21)  $\sin x = \frac{76}{95}$
 $x = \sin^{-1}\left(\frac{76}{95}\right)$
 $x = 53^\circ$


22)  $\sin x = \frac{72}{75}$
 $x = \sin^{-1}\left(\frac{72}{75}\right)$
 $x = 71^\circ$

#21-26
Any TRIG Function!!

23)  $\cos x = \frac{33}{55}$
 $x = \cos^{-1}\left(\frac{33}{55}\right)$
 $x = 53^\circ$

24)  $\cos x = \frac{65}{97}$
 $x = \cos^{-1}\left(\frac{65}{97}\right)$
 $x = 48^\circ$

25)  $\tan x = \frac{39}{52}$
 $x = \tan^{-1}\left(\frac{39}{52}\right)$
 $x = 37^\circ$

26)  $\tan x = \frac{24}{70}$
 $x = \tan^{-1}\left(\frac{24}{70}\right)$
 $x = 71^\circ$