Three Primary and Three Reciprocal Ratios.

$$\sin\theta = \frac{opposite}{hypotenuse} \qquad \csc\theta = \frac{hypotenuse}{opposite}$$

"cosecant"

$$\cos\theta = \frac{adjacent}{hypotenuse} \qquad \sec\theta = \frac{hypotenuse}{adjacent}$$

"Secant"

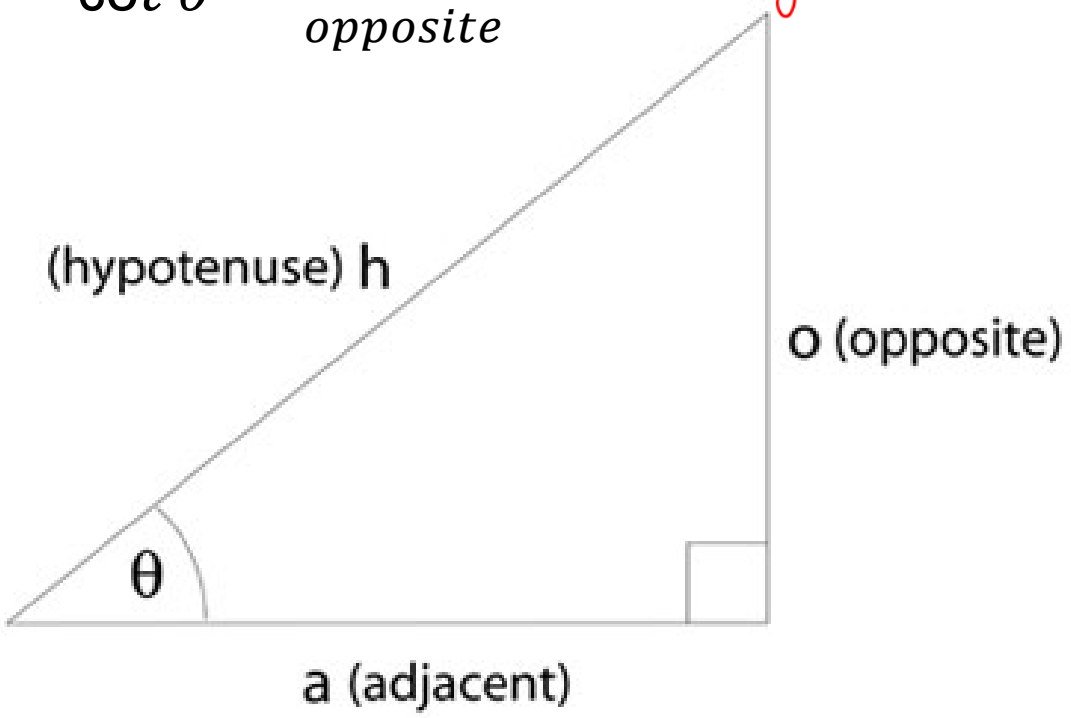
$$\tan\theta = \frac{opposite}{adjacent} \qquad \cot\theta = \frac{adjacent}{opposite}$$

"cotangent"

$$\csc\theta = \frac{1}{\sin\theta}$$

$$\sec\theta = \frac{1}{\cos\theta}$$

$$\cot\theta = \frac{1}{\tan\theta}$$



There are no *csc, sec, cot* buttons on the calculator!

Determine the following ratios:

1. $\sin 36^\circ$

$= 0.5878$

2. $\csc 86^\circ = \frac{1}{\sin 86} = 1.0024$

3. $\sec 23^\circ$

$= \frac{1}{\cos 23} = 1.0864$

4. $\cot 75^\circ$

$= \frac{1}{\tan 75} = 0.2679$

Determine the following angles:

1. $\cos\theta = 0.2745$

$\theta = \cos^{-1}(0.2745)$

$\theta = 74°$

2. $\sec\theta = 3.2471$

$\frac{1}{\cos\theta} = 3.2471$

$\frac{1}{3.2471} = \cos\theta$

$\cos^{-1}\left(\frac{1}{3.2471}\right) = \theta$

$72° = \theta$

3. $\csc\theta = 1.2241$

$\sin\theta = \frac{1}{1.2241}$

$\theta = \sin^{-1}\left(\frac{1}{1.2241}\right)$

$\theta = 55°$

4. $\cot\theta = 5.3267$

$\tan\theta = \frac{1}{5.3267}$

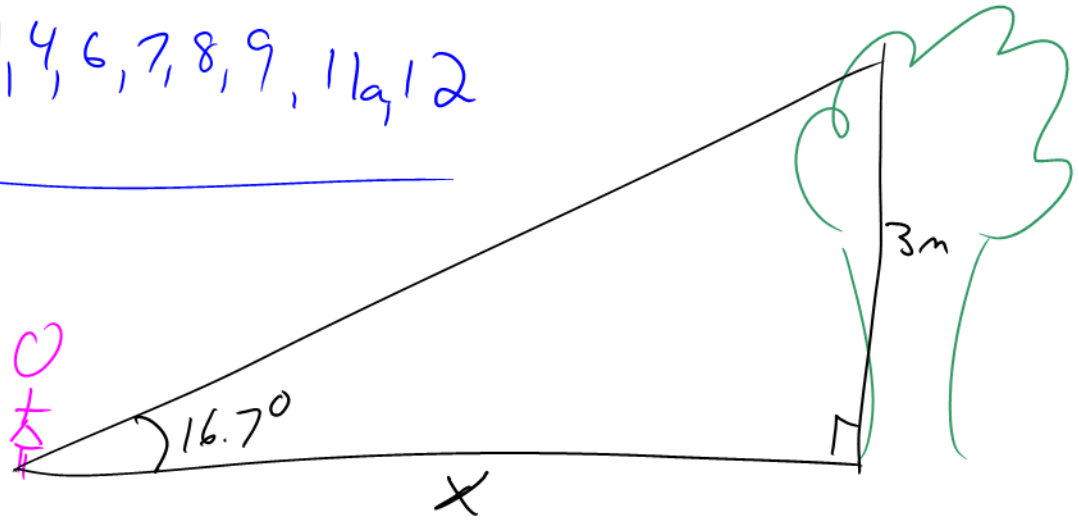
$\theta = \tan^{-1}\left(\frac{1}{5.3267}\right)$

$\theta = 11°$

A word problem:

From a position some distance away from the base of a tree, Monique uses a clinometer and determines that the angle of elevation to the top of the tree is 16.7º. Monique estimates that the high of the tree is 3m. How far away is Monique from the base of the tree?

Hw pg 280 # 1, 4, 6, 7, 8, 9, 11a, 12



$\tan 16.7^\circ = \frac{3}{x}$

$\cot 16.7 = \frac{x}{3}$

$x = \frac{3}{\tan 16.7}$ → $x = 10\,m$