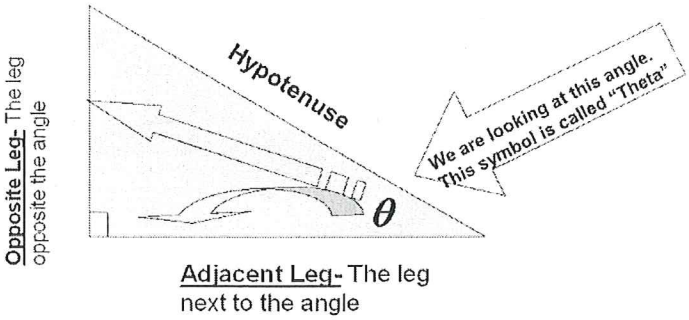
Acc Geometry Student Notes
Trigonometry

Key ☺

Make sure your calculator mode is set to degree!!

Trig ratios work for RIGHT TRIAGNLES only (for right now)



USING TRIG RATIOS

$$\sin\theta = \frac{\text{Length of leg opposite } \angle\theta}{\text{Length of hypotenuse}} = \frac{\text{Opposite}}{\text{Hypotenuse}}$$

$$\cos\theta = \frac{\text{Length of leg adjacent } \angle\theta}{\text{Length of hypotenuse}} = \frac{\text{Adjacent}}{\text{Hypotenuse}}$$

$$\tan\theta = \frac{\text{Length of leg opposite } \angle\theta}{\text{Length of leg adjacent } \angle\theta} = \frac{\text{Opposite}}{\text{Adjacent}}$$

Soh-Cah-Toa

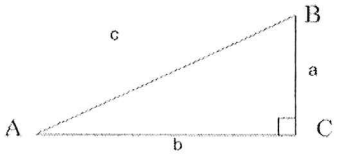
- $S = {}^{O}/_{H}$
- $C = {}^{A}/_{H}$
- $T = {}^{O}/_{A}$

Some Old Hags
O H

Can't Always Handle
A H

Their Old Age
O H

Consider the triangle ABC, shown below.



sin ∠ A = a/c cos ∠ A = b/c

tan ∠ A = a/b

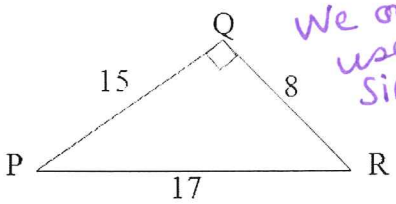
sin ∠ B = b/c cos ∠ B = a/c

tan ∠ B = b/a

We do not use the right angle for trig ratios, so there is no sine, cosine, or tangent of ∠ C.

If our triangle has the measures of the side lengths labeled, we can express these ratios as fractions ~~or decimals.~~

We only use simplified fractions.



sin ∠ P = 8/17 or ____ cos ∠ P = 15/17 or ____

cos ∠ R = 8/17 or ____ tan ∠ R = 15/8 or ____

Using your calculator with Trig:

$\sin(57°) =$ .84 $\cos(41°) =$ .75

$\theta = \tan^{-1}\left(\frac{5}{6}\right)$

$\theta \approx 39.8°$

$\theta = \sin^{-1}\left(\frac{9}{17}\right)$

$\theta \approx 31.97°$

$\sin(47°) = \frac{x}{9}$

$x = 6.58$

$\tan(61°) = \frac{9}{x}$

$\frac{x \cdot \tan(61)}{\tan(61)} = \frac{9}{\tan(61)}$

$x = 4.99$

$\tan\theta = \frac{20}{35}$

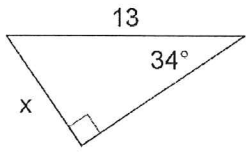
$\tan^{-1}(20/35) = \theta$

$\theta = 29.74°$

$\cos\theta = \frac{5}{7}$

Using Trigonometry to find Side Lengths

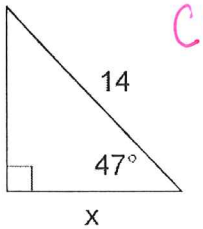
1.



$\sin 34 = \frac{x}{13}$

$\boxed{x = 7.27}$

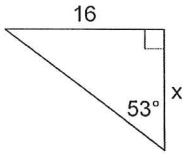
2.



$\cos 47 = \frac{x}{14}$

$\boxed{x = 9.55}$

3.

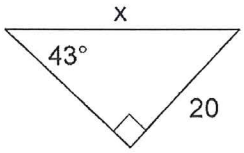


$\tan 53 = \frac{16}{x}$

$\frac{x \tan 53}{\tan 53} = \frac{16}{\tan 53}$

$\boxed{x = 12.06}$

4.



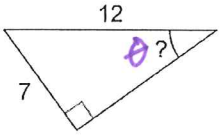
$\sin 43 = \frac{20}{x}$

$x \sin 43 = 20$

$\boxed{x = 29.33}$

Using Trigonometry to find Angles

1.

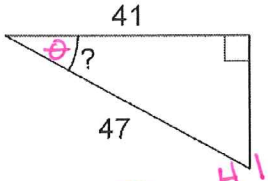


$\sin\theta = \frac{7}{12}$

$\theta = \sin^{-1}(7/12)$

$\boxed{\theta = 35.69°}$

2.

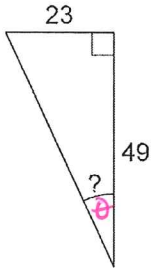


$\cos\theta = \frac{41}{47}$

$\theta = \cos^{-1}\left(\frac{41}{47}\right)$

$\boxed{\theta = 29.27°}$

3.



$\tan\theta = \frac{23}{49}$

$\theta = \tan^{-1}\left(\frac{23}{49}\right)$

$\boxed{\theta \approx 25.14°}$