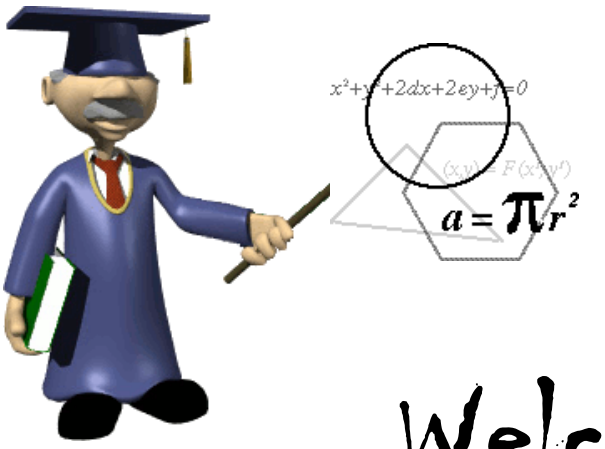
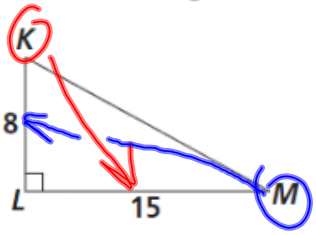
L9.2



Welcome Back!

Use the figure for Exercises 1–3.



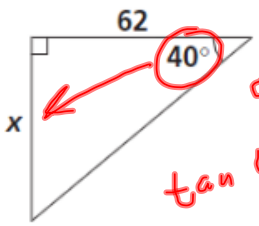
1. Write the tangent ratio for $\angle K$. $\frac{15}{8}$

2. Write the tangent ratio for $\angle M$. $\frac{8}{15}$

3. Find $m\angle M$ to the nearest degree. 28° $m^\circ = \tan^{-1}\left(\frac{8}{15}\right)$

Find x to the nearest whole number.

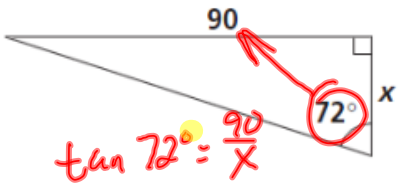
4.



$\tan 40^\circ = \frac{x}{62}$ 52

$x = 62 \tan 40^\circ$

5.

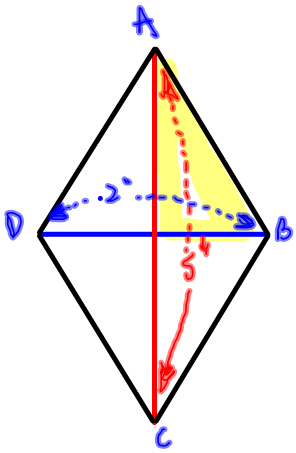


29

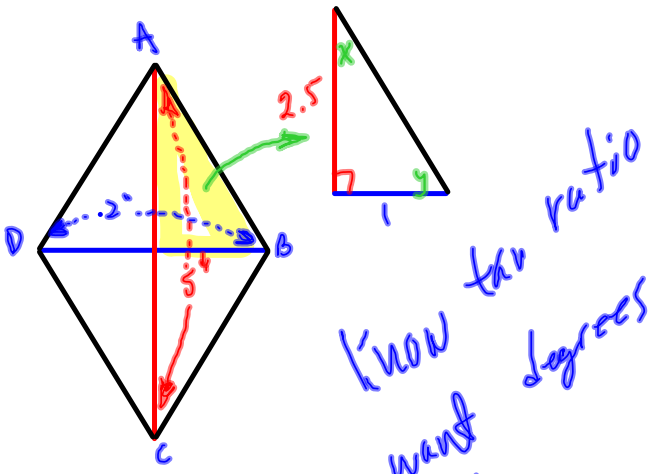
$\tan 72^\circ = \frac{90}{x}$

$x = \frac{90}{\tan 72^\circ}$

Pg 473
#21



Pg 473
#21



know tan ratio

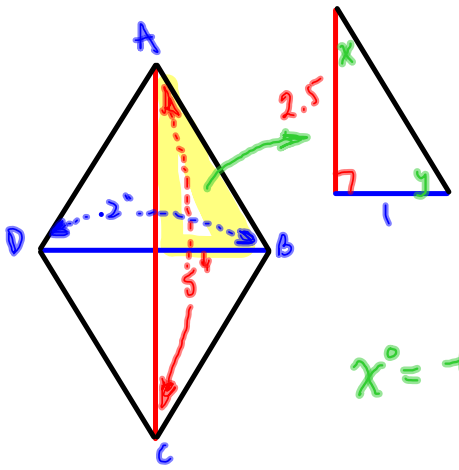
degrees

want

↓

tan⁻¹

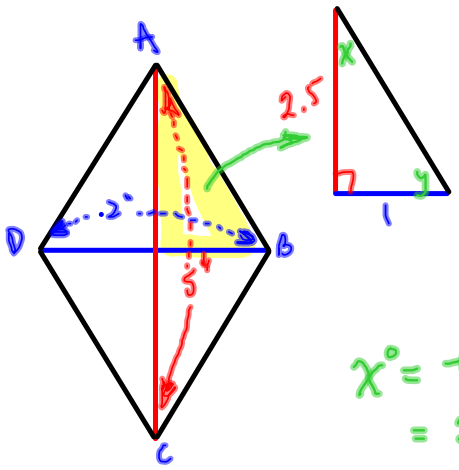
Pg 473
#21



$x° = \tan^{-1}\frac{1}{2.5}$

$y° = \tan^{-1}\frac{2.5}{1}$

Pg 473
#21



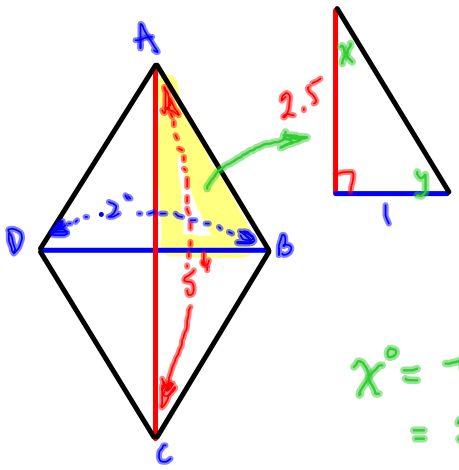
$x° = \tan^{-1}\frac{1}{2.5}$

$= 21.8°$

$y° = \tan^{-1}\frac{2.5}{1}$

$= 68.2°$

Pg 473
#21



$x° = \tan^{-1}\frac{1}{2.5}$

$= 21.8°$

$y° = \tan^{-1}\frac{2.5}{1}$

$= 68.2°$

$m\angle A = 2x = 43.6° \approx 44°$

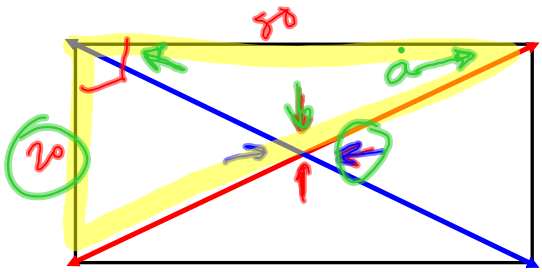
$m\angle B = 2y = 136.4° \approx 136°$

$\tan x^\circ = \frac{20}{1} = \frac{\text{opp}}{\text{adj}}$ ratio

tan

(known

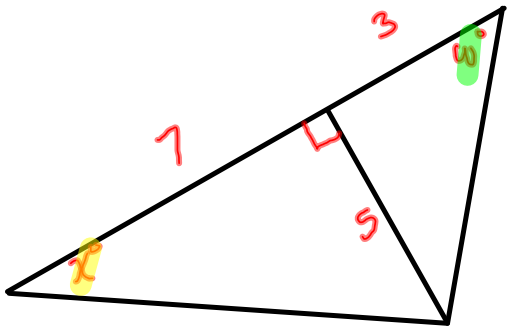
$x^\circ = \tan^{-1}\left(\frac{20}{1}\right)$



$$a^\circ = \tan^{-1}\left(\frac{20}{80}\right)$$

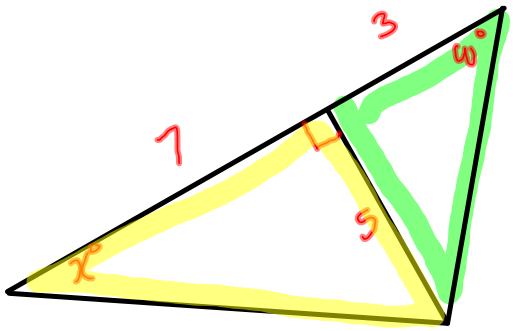
pg 473

29



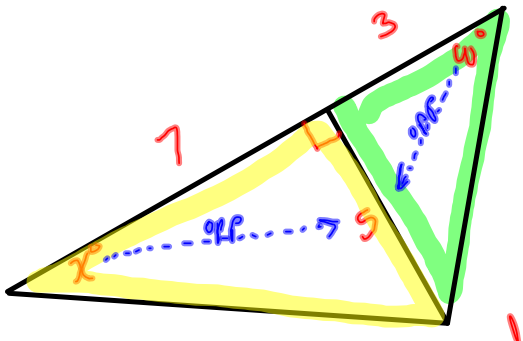
pg 473

29



pg 473

(29)

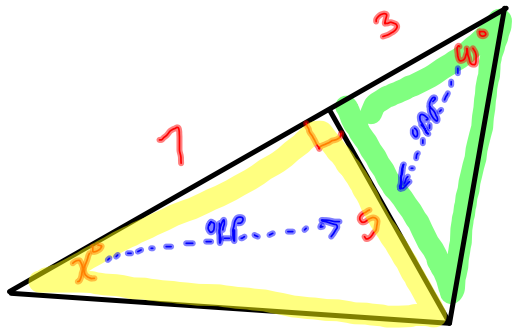


know tan ratio

want degree

pg 473

(29)

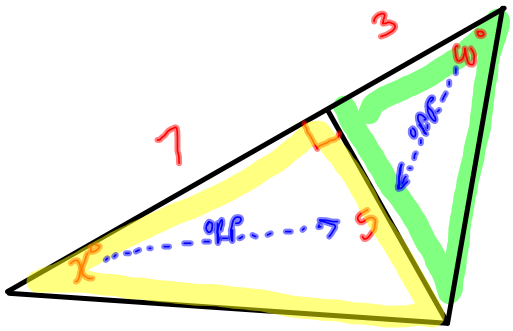


$x° = \tan^{-1}\left(\frac{5}{7}\right)$

$w° = \tan^{-1}\left(\frac{5}{3}\right)$

pg 473

(29)



$x° = \tan^{-1}\left(\frac{5}{7}\right)$

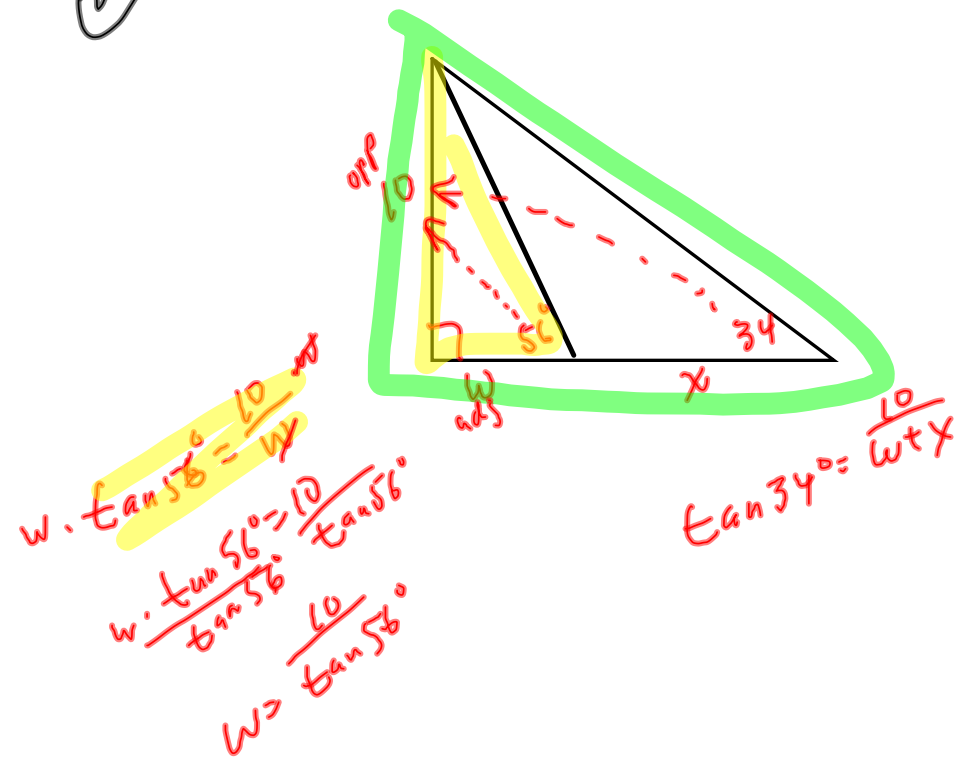
$= 35.5°$

$\approx 36°$

$w° = \tan^{-1}\left(\frac{5}{3}\right)$

$= 59.0°$

$\approx 59°$



$w \cdot \tan 56° = \frac{10}{w}$

$w \cdot \tan 56° = 10$

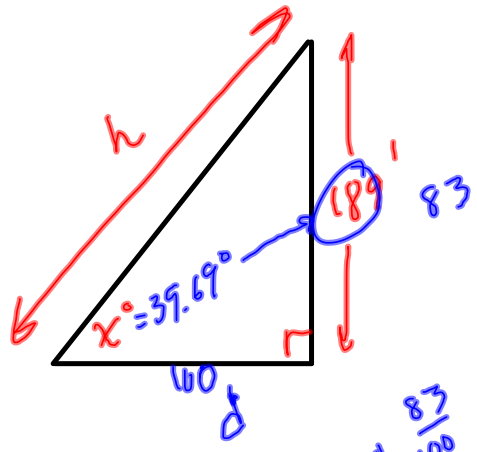
$\frac{w \cdot \tan 56°}{\tan 56°} = \frac{10}{\tan 56°}$

$w = \frac{10}{\tan 56°}$

$\tan 34° = \frac{10}{w+x}$

pg 474

33



$83\% = \frac{83}{100}$

$x° = \tan^{-1}\frac{83}{100}$

$= 39.69°$

$\tan 39.69° = \frac{189}{d}$

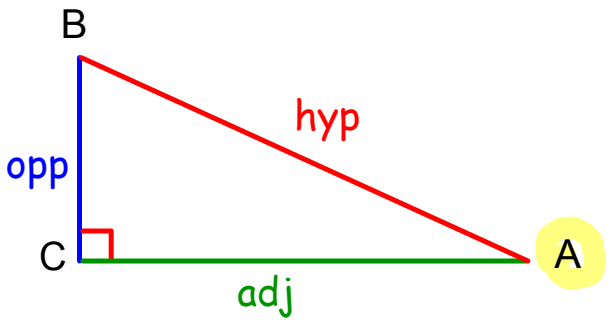
$d = \frac{189}{\tan 39.69°} = 227$

$h^2 = 189^2 + d^2$

$h = \sqrt{189^2 + 227^2}$

$= 295.9$

Defn: Sine and Cosine Ratios

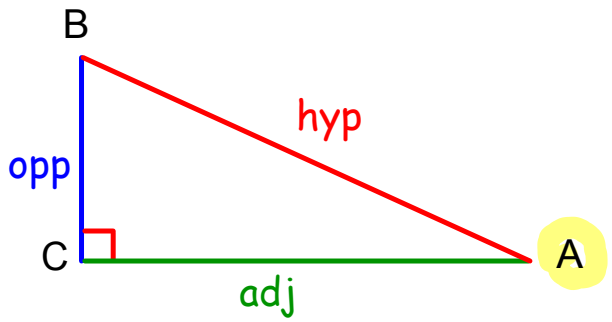


$$\tan A = \frac{\text{opp}}{\text{adj}}$$

Defn: Sine and Cosine Ratios

sin A = ———

cos A = ———

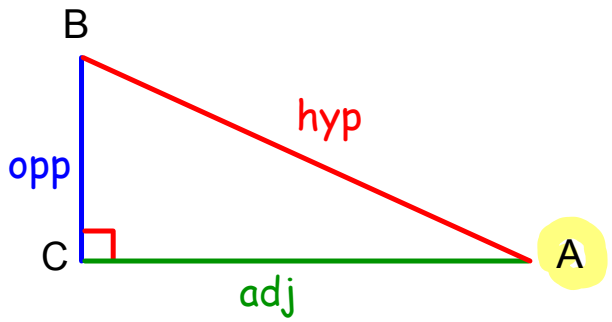


tan A = $\frac{\text{opp}}{\text{adj}}$

Defn: Sine and Cosine Ratios

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

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



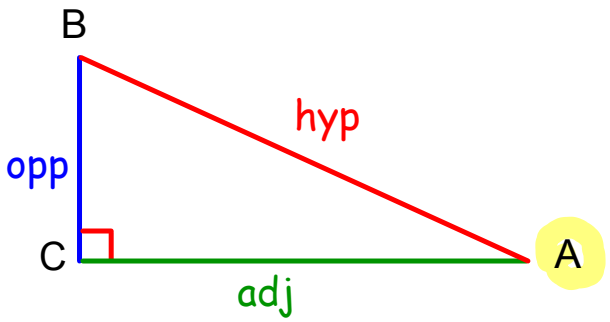
$$\tan A = \frac{\text{opp}}{\text{adj}}$$

Defn: Sine and Cosine Ratios

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

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

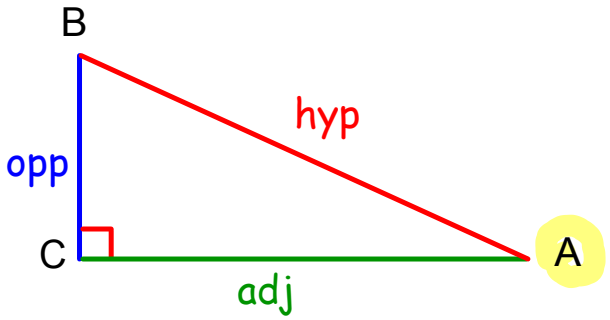
$$\tan A = \frac{\text{opp}}{\text{adj}}$$



Defn: Sine and Cosine Ratios

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

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

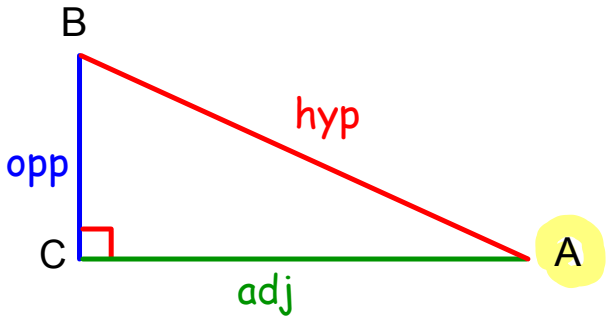


$$\tan A = \frac{\text{opp}}{\text{adj}} = \frac{BC}{AC}$$

Defn: Sine and Cosine Ratios

$$\sin A = \frac{\text{opp}}{\text{hyp}} = \text{——}$$

$$\cos A = \frac{\text{adj}}{\text{hyp}} = \text{——}$$

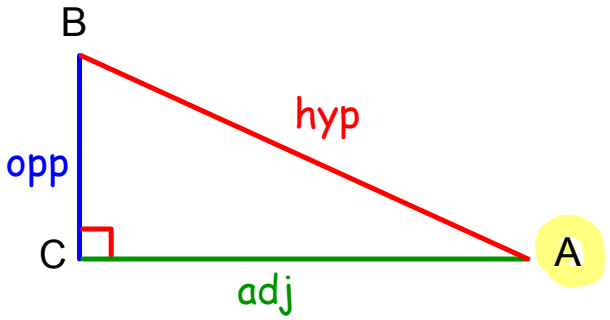


$$\tan A = \frac{\text{opp}}{\text{adj}} = \frac{BC}{AC}$$

Defn: Sine and Cosine Ratios

$$\sin A = \frac{\text{opp}}{\text{hyp}} = \frac{}{AB}$$

$$\cos A = \frac{\text{adj}}{\text{hyp}} = \frac{}{AB}$$

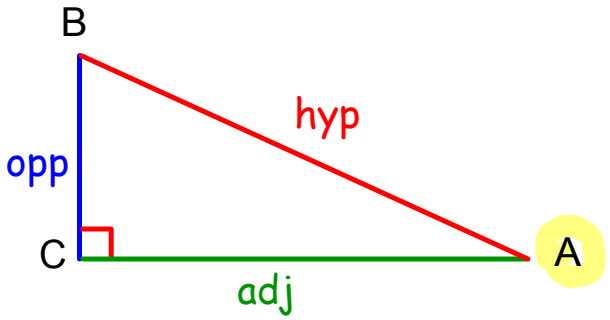


$$\tan A = \frac{\text{opp}}{\text{adj}} = \frac{BC}{AC}$$

Defn: Sine and Cosine Ratios

$$\sin A = \frac{\text{opp}}{\text{hyp}} = \frac{BC}{AB}$$

$$\cos A = \frac{\text{adj}}{\text{hyp}} = \frac{AC}{AB}$$



$$\tan A = \frac{\text{opp}}{\text{adj}} = \frac{BC}{AC}$$

Easy way to keep the trig ratios straight...

$$\text{Sin } A = \frac{\text{Opp}}{\text{Hyp}}$$

$$\text{Cos } A = \frac{\text{Adj}}{\text{Hyp}}$$

$$\text{Tan } A = \frac{\text{Opp}}{\text{Adj}}$$

Easy way to keep the trig ratios straight...

$$\text{Sin } A = \frac{\text{Opp}}{\text{Hyp}}$$

SOH-CAH-TOA

$$\text{Cos } A = \frac{\text{Adj}}{\text{Hyp}}$$

$$\text{Tan } A = \frac{\text{Opp}}{\text{Adj}}$$

Easy way to keep the trig ratios straight...

SOH: $\sin A = \frac{\text{Opp}}{\text{Hyp}}$

SOH-CAH-TOA

CAH: $\cos A = \frac{\text{Adj}}{\text{Hyp}}$

TOA: $\tan A = \frac{\text{Opp}}{\text{Adj}}$

Easy way to keep the trig ratios straight...

SOH: $\sin A = \frac{\text{Opp}}{\text{Hyp}}$

SOH-CAH-TOA

CAH: $\cos A = \frac{\text{Adj}}{\text{Hyp}}$

TOA: $\tan A = \frac{\text{Opp}}{\text{Adj}}$

Easy way to keep the trig ratios straight...

SOH-CAH-TOA

SOH: Sine Opposite over Hypotenuse

CAH: Cosine Adjacent over Hypotenuse

TOA: Tangent Opposite over Adjacent


CAH TOA

What does this mean?

$\tan^{-1}(x)$

What does this mean?

$$\tan^{-1}(x) = \tan^{-1}\left(\frac{\text{opp}}{\text{adj}}\right)$$

What does this mean?

$\tan^{-1}(x) = \tan^{-1}\left(\frac{\text{opp}}{\text{adj}}\right)$ = the measure of the angle whose tan is $\frac{\text{opp}}{\text{adj}}$

The Inverse Trig Ratios

$\sin^{-1}\left(\frac{opp}{hyp}\right)$ = the measure of the angle whose sin is $\frac{opp}{hyp}$

$\cos^{-1}\left(\frac{adj}{hyp}\right)$ = the measure of the angle whose cos is $\frac{adj}{hyp}$

$\tan^{-1}\left(\frac{opp}{adj}\right)$ = the measure of the angle whose tan is $\frac{opp}{adj}$


questions...
next...

1 sinT=

skip to next page for quest

2 cosT=

skip to next page for quest

3 sinG=

skip to next page for quest

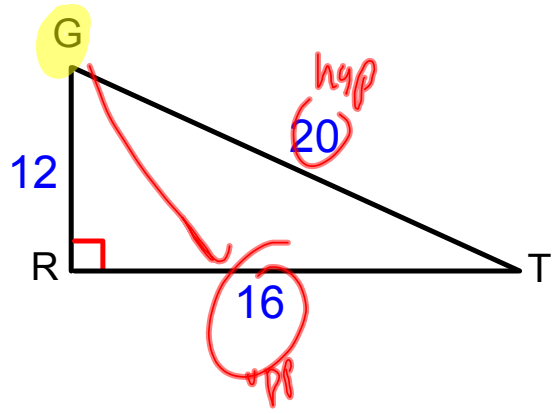
Example

1) sinT =

2) cosT =

3) sinG = $\frac{opp}{hyp} = \frac{16}{20}$

4) cosG =

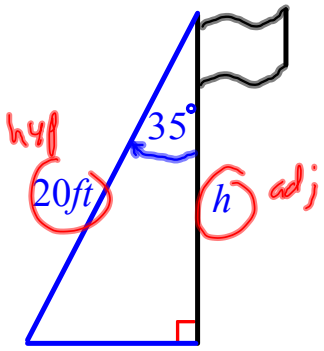


...back

4

Example

A 20 *ft* wire supporting a flagpole forms a 35 angle w/the flagpole.
To the nearest foot, how high is the flagpole?



adj, hyp → cos

$\cos 35^\circ = \frac{adj}{hyp} = \frac{h}{20}$

$h = 20 \cos 35^\circ$

5

1 1) mA=

Example

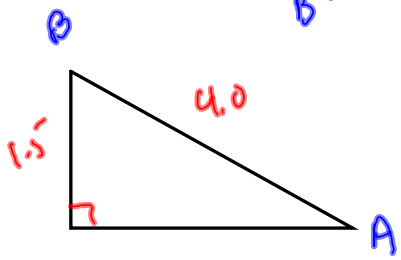
A right Δ has a leg 1.5 units long and a hypotenuse 4.0 units long.
Find the measures of its acute angles to the nearest degree.
Call the smaller angle A and the larger B.

1) m∠A =

2) m∠B =

$A^\circ = \sin^{-1}\left(\frac{1.5}{4.0}\right) \approx 22^\circ$

$B^\circ = \cos^{-1}\left(\frac{1.5}{4.0}\right) \approx 68^\circ$



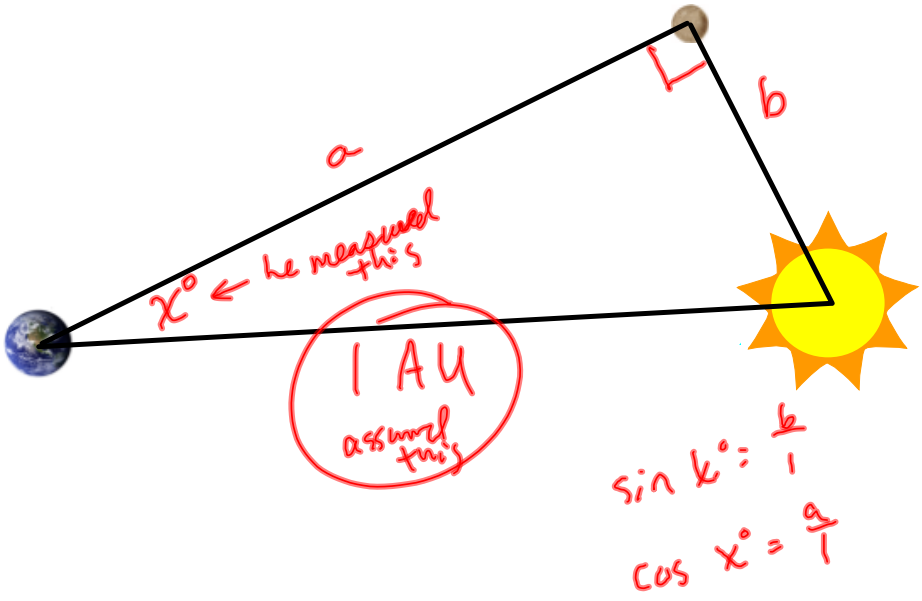
2

...back

A real life example of using these trig ratios...

1500's Copernicus, astronomer

1 AU is the avg dist from Earth to the Sun



L9.2 HW Problems

Pg 479 #1-17, 22-24, 26, 28, 37, 43, 45-47