Solving for Angles using the Primary Trigonometric Ratios

Solve for the unknown in the following:

$8 \times \left(\sin 35 = \dfrac{x}{8} \right) \times 8$

$8 \sin 35 = x$

$4.6 = x$

$y \times \left(\tan 62 = \dfrac{3}{y} \right) \times y \rightarrow$ Note: $\boxed{\tan 62 = \dfrac{3}{\textcircled{y}}}$

$\dfrac{y \tan 62}{\tan 62} = \dfrac{3}{\tan 62}$

$y = \dfrac{3}{\tan 62}$

$y = 1.6$

$y = \dfrac{3}{\tan 62}$

Notice: When the unknown is in the numerator, multiply the trig ratio by the denominator
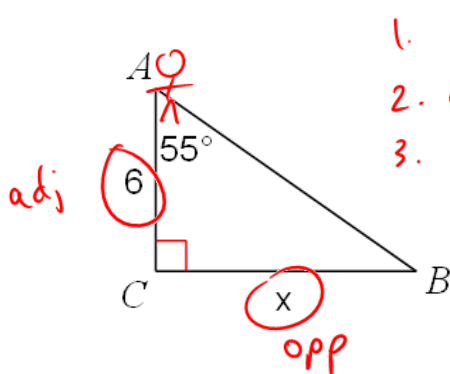
When the unknown is in the denominator, switch the denominator with the trig ratio
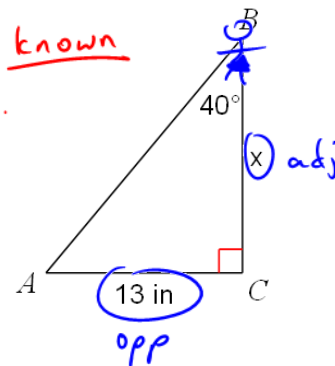
$S\overset{O}{\underset{H}{}} C\overset{A}{\underset{H}{}} T\overset{O}{\underset{A}{}}$

Solve for the unknown side in the following examples

1. Pick a given angle
2. Choose an unknown and one known
3. Use a trig ratio to solve.

adj ⬤6   55° triangle with A, C, B, x (opp)

use $T\overset{O}{\underset{A}{}}$

$6 \times \left(\tan 55° = \dfrac{x}{6} \right) \times 6$

$8.6 = x$

40° triangle with B, A, C, 13 in (opp), x adj

use $T\overset{O}{\underset{A}{}}$

$\boxed{\tan 40° = \dfrac{13}{x}}$

$x = \dfrac{13}{\tan 40}$

$x = 15.5 \text{ in}$

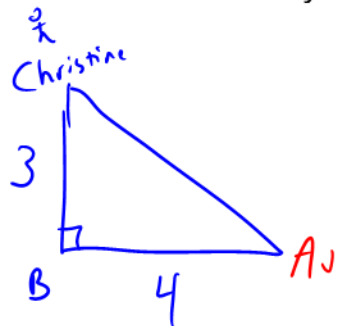$\boxed{\text{Do } \#11-14}$

Finish the handout then do AWESOME PROBLEMS from
pg 403-404: #1, 2, 5ii a and b, 7.
On Monday we will do pg 412: 4 - 6, 9 - 13, 15 - 17. These problems
will SHOCK and amaze you!

Christine

$\tan A = \frac{3}{4}$

$\angle A = \tan^{-1}\left(\frac{3}{4}\right)$

$\angle A = 37°$

$\tan C = \frac{4}{3}$

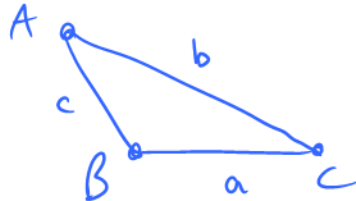$\angle C = \tan^{-1}\left(\frac{4}{3}\right)$

$\angle C = 53°$

Solving a Triangle

Solving a Triangle means: Find out everything about the triangle
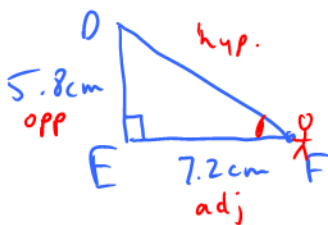ie. all 3 sides and angles.

- a useful tool is a chart

$\angle A =$	$a =$
$\angle B =$	$b =$
$\angle C =$	$c =$

Labelling sides and Angles on a Triangle:

A

b

c

B a C

Example 1.

In $\triangle DEF$, $\angle E = 90°$, $d = 7.2cm$, and $f = 5.8cm$. Solve the triangle. (pictures are your friends!)

D hyp.

5.8cm
opp

E 7.2 cm F
     adj

$T\,\dfrac{O}{A}$

$\tan F = \dfrac{5.8}{7.2}$

$\angle F = \tan^{-1}\left(\dfrac{5.8}{7.2}\right)$

$\angle F = 39°$

$\angle D = 51°$ (ASTT)	$d = 7.2\,cm$
$\angle E = 90°$	$e = 9.2\,cm$ (PT)
$\angle F = 39°$	$f = 5.8\,cm$

$\angle D = 180 - 90 - 39 = 51°$

$5.8^2 + 7.2^2 = e^2$

$85.48 = e^2$

$9.2 = e$

Example 2.

A 6m ladder is leaning against a house. If the bottom of the ladder is 1.2m from the house,
determine the angle the ladder makes with the ground.

$S\,\dfrac{O}{H}\ \left(C\,\dfrac{A}{H}\right)\ T\,\dfrac{O}{A}$

hyp
6m
ladder

A

adj → 1.2m
ground

$\cos A = \dfrac{1.2}{6}$

$\angle A = \cos^{-1}\left(\dfrac{1.2}{6}\right)$

$\angle A = 78°$

The ladder and ground make a 78° angle.