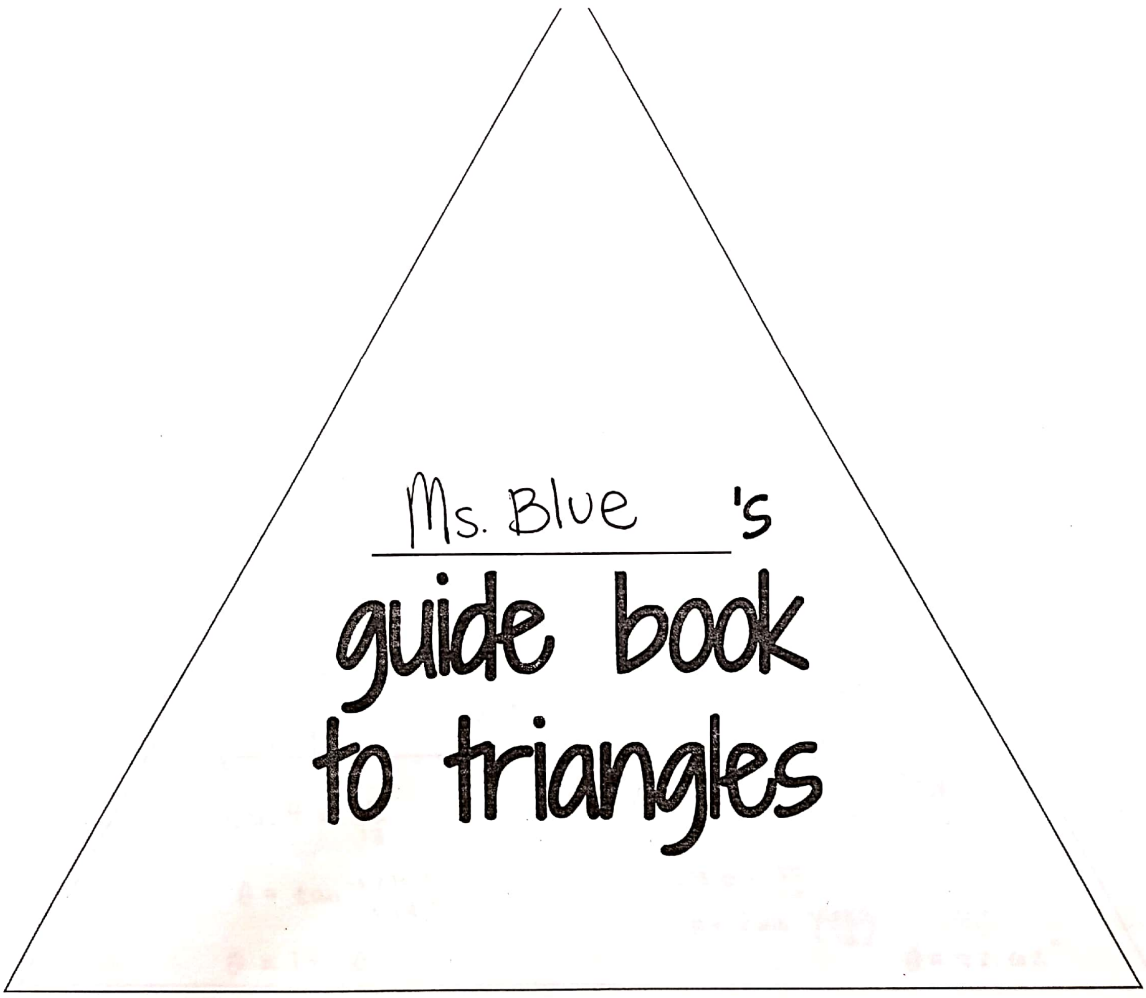
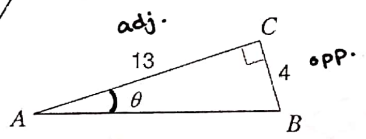


SOH
CAH
TOA
(finding angles)

This can only be used with right triangles. Use inverse sin, cos, and tan!

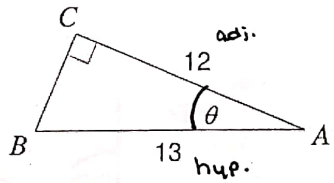
$\sin(x) = \frac{\text{opp.}}{\text{hyp.}}$ $\cos(x) = \frac{\text{adj.}}{\text{hyp.}}$ $\tan(x) = \frac{\text{opp.}}{\text{adj.}}$



$\tan\theta = \frac{4}{13}$

$\theta = \tan^{-1}\left(\frac{4}{13}\right)$

$\theta = 17.10^\circ$



$\cos\theta = \frac{12}{13}$

$\theta = \cos^{-1}\left(\frac{12}{13}\right)$

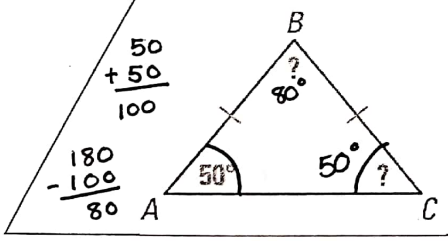
$\theta = 22.62^\circ$

Isosceles Triangles

Triangle's angles add up to be 180°

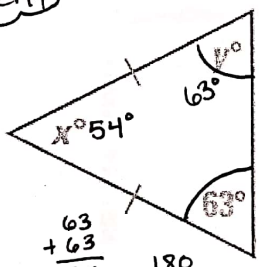
If two sides in a triangle are congruent then angles are congruent those sides are congruent

base angles are congruent



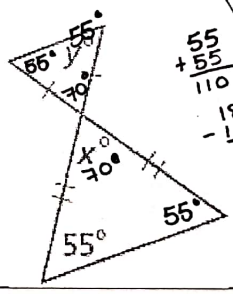
50 + 50 = 100

180 − 100 = 80



63 + 63 = 126

180 − 126 = 54



55 + 55 = 110

180 − 110 = 70

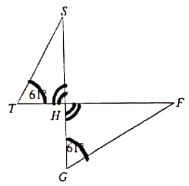
180 − 70 = 110

110 ÷ 2 = 55

Triangle Similarity

Ways to prove similarity

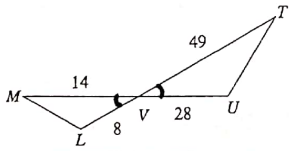
AA



SAS

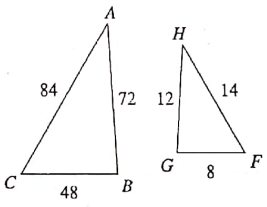
$\frac{14}{49} = \frac{2}{7}$ ✓

$\frac{8}{28} = \frac{2}{7}$



SSS

$\frac{8}{48} = \frac{1}{6}$ ✓



$\frac{12}{72} = \frac{1}{6}$ ✓

$\frac{14}{84} = \frac{1}{6}$ ✓

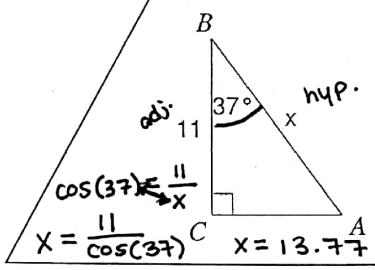
SOH
CAH
TOA
(finding sides)

This can only be used with right triangles.

$\sin(x) = \frac{\text{opp.}}{\text{hyp.}}$

$\cos(x) = \frac{\text{adj.}}{\text{hyp.}}$

$\tan(x) = \frac{\text{opp.}}{\text{adj.}}$



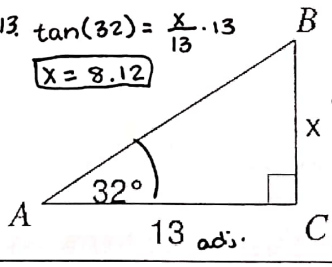
$\cos(37) = \frac{11}{x}$

$x = \frac{11}{\cos(37)}$

$x = 13.77$

13 $\tan(32) = \frac{x}{13} \cdot 13$

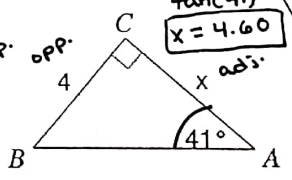
$x = 8.12$



$\tan(41) = \frac{4}{x}$

$x = \frac{4}{\tan(41)}$

$x = 4.60$



SOHCAHTOA Applications

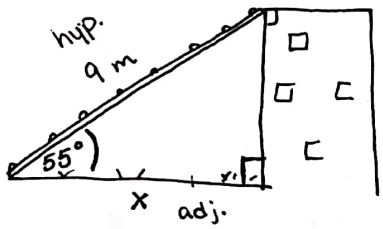
P- S- W- A-

example: As it leans against a building, a 9-meter ladder makes an angle of elevation that is 55°. How far is the bottom of the ladder from the base of the building?

$9 \cdot \cos(55) = \frac{x}{9} \cdot 9$

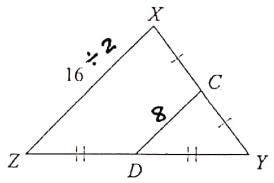
$9\cos(55) = x$

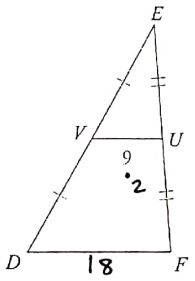
$x = 5.16\ m$



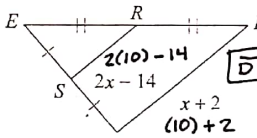
Angle of elevation- from the ground up angle of depression- "sky" to ground

Triangle Midsegment





$\overline{SR} = 6$



$\overline{DF} = 12$

$2(2x-14) = x+2$

$4x - 28 = x + 2$

$-x \quad -x$

$3x - 28 = 2$

$+28 \quad +28$

$\frac{3x}{3} = \frac{30}{3}$

$x = 10$