Geometry

Ch. 8 Handout 8.3

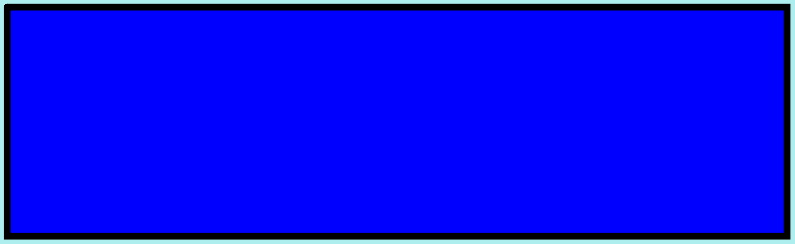
The Tangent Ratio

http://teachertube.com/viewVideo.php?video_id=27042&title=SohCahToa

What is the Pythagorean Theorem formula?

$$a^2 + b^2 = c^2$$

$$(\text{leg})^2 + (\text{leg})^2 = (\text{hyp})^2$$

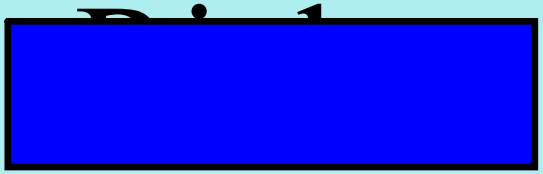


When do you use Pythagorean Theorem?

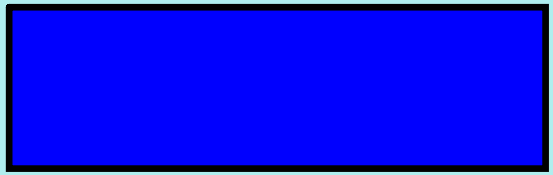
Types of Triangles:

$$c^2 > a^2 + b^2$$

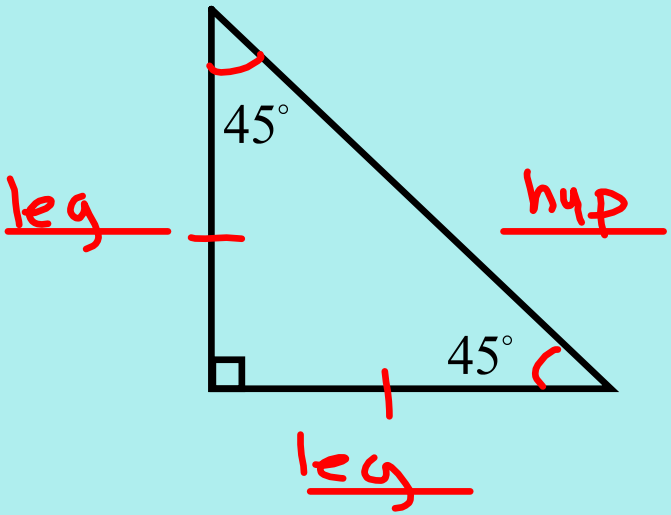
$$c^2 = a^2 + b^2$$

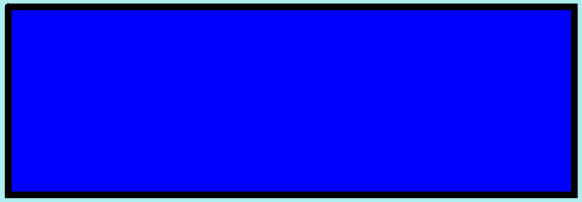


$$c^2 < a^2 + b^2$$



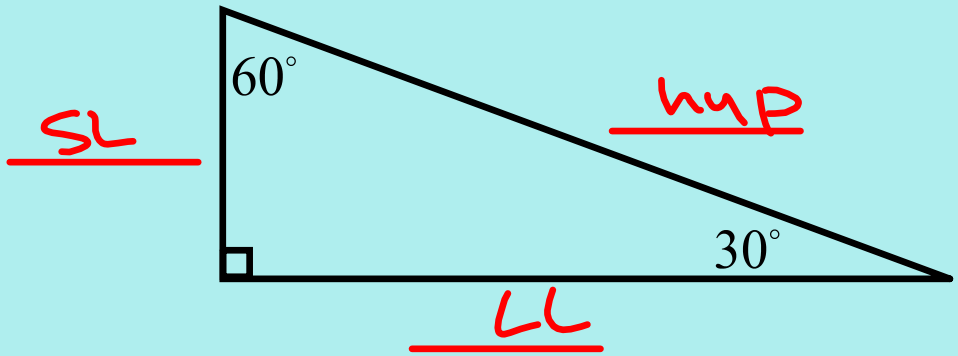
Label the parts of a 45-45-90 triangle:

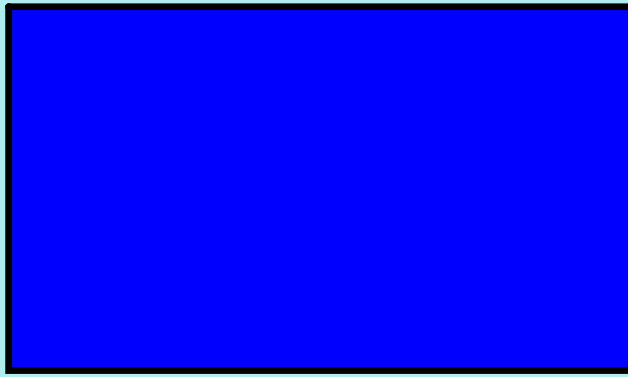




Formula: $hyp = leg\sqrt{2}$

Label the parts of a 30-60-90 triangle:





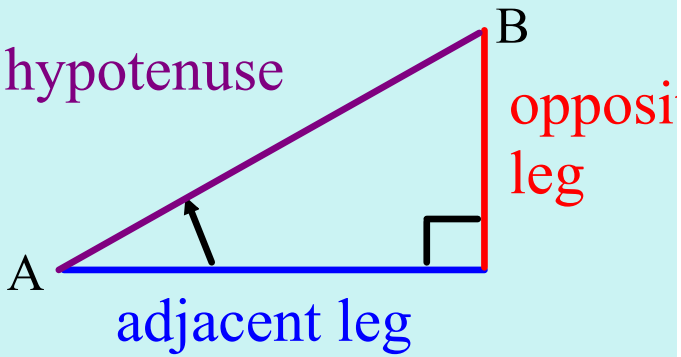
Formula: $hyp = SL \cdot 2$

$LL = SL \cdot \sqrt{3}$

Trigonometry means "triangle measurement"

The tangent of an acute angle in a right triangle is a ratio of the length of the opposite side of an angle to the length of the adjacent side of an angle.

$$\tan \angle A = \frac{length\ of\ opposite\ leg}{length\ of\ adjacent\ leg}$$



(shorter version) $\tan \angle A = \frac{opp}{adj}$

side length / on calc [tan]

∠ measurement / $\tan^{-1}$ on calc [tan]

1. Write the tangent ratios for $\angle A$ and $\angle B$.

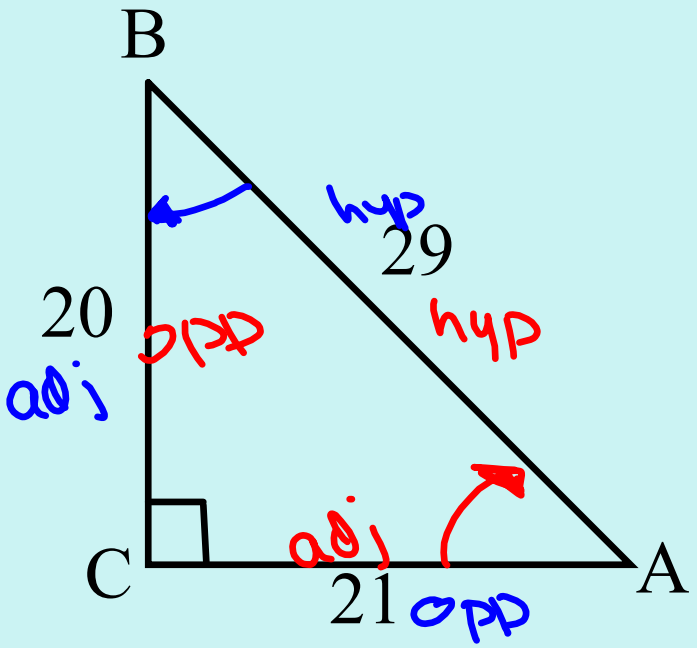
$\tan \angle = \frac{opp}{adj}$

given ∠

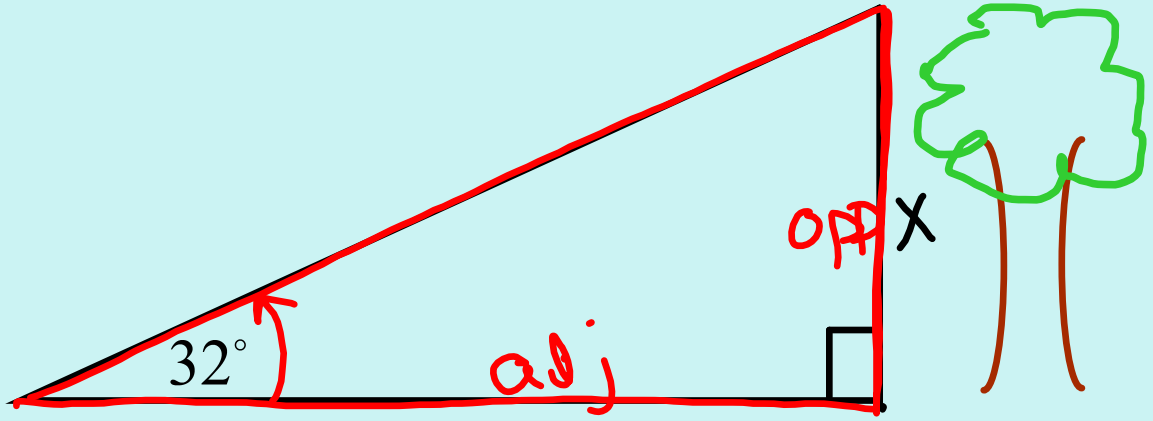
$\tan A = \frac{20}{21}$

given ∠

$\tan B = \frac{21}{20}$



2. To measure the height of a tree, Alma walked 125 ft. from the tree and measured a 32° angle from the ground to the top of the tree. Estimate the height of the tree.



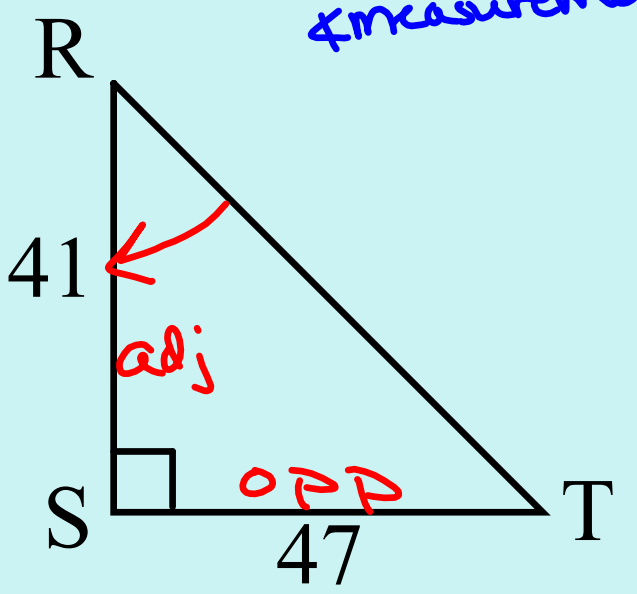
side length

$125 \tan 32 = \frac{x}{125}(125)$

$125 \tan 32 = x$

$x \approx 78.1$ ft

3. Using the Inverse of Tangent, find $m\angle R$ to the nearest degree.



∠measurement

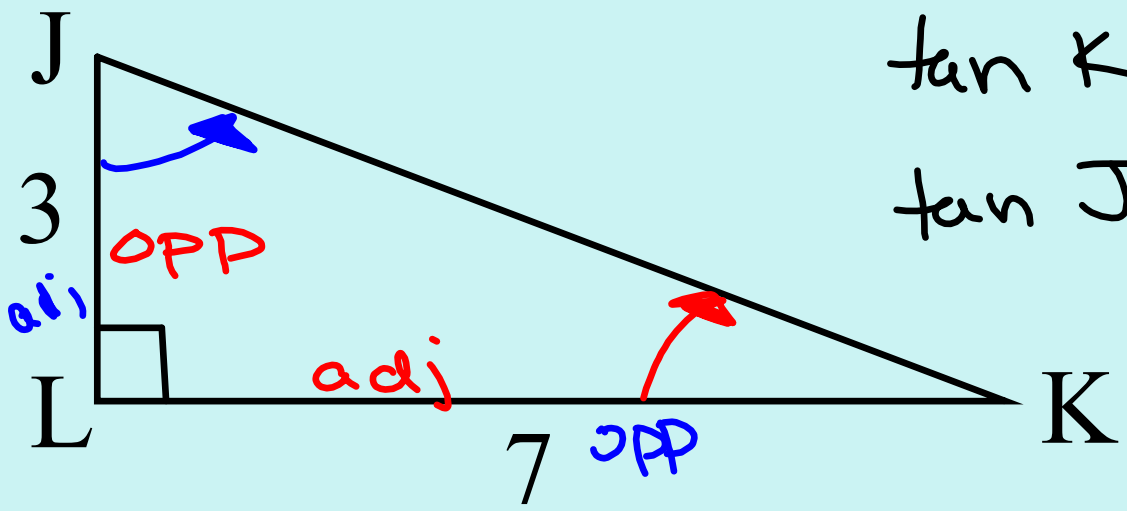
$\tan R = \frac{47}{41}$

$m\angle R = \tan^{-1}\left(\frac{47}{41}\right)$

$m\angle R \approx 49^\circ$

4. a) Write the tangent ratios for $\angle K$ and $\angle J$.

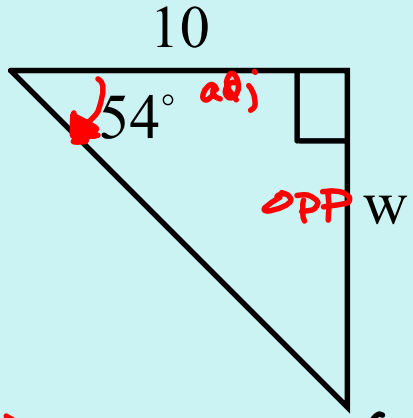
b) How is tan K related to tan J?



$\tan K = \frac{3}{7}$

$\tan J = \frac{7}{3}$

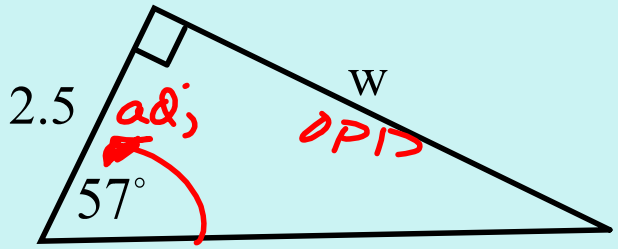
5). Find the value of *w* to the nearest tenth.



$\tan 54 = \frac{w}{10}$ (10)

$10 \tan 54 = w$

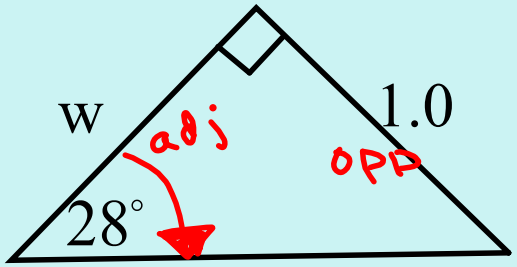
$w \approx 13.8$



$2.5 \tan 57 = \frac{w}{2.5}$ (2.5)

$2.5 \tan 57 = w$

$w \approx 3.8$



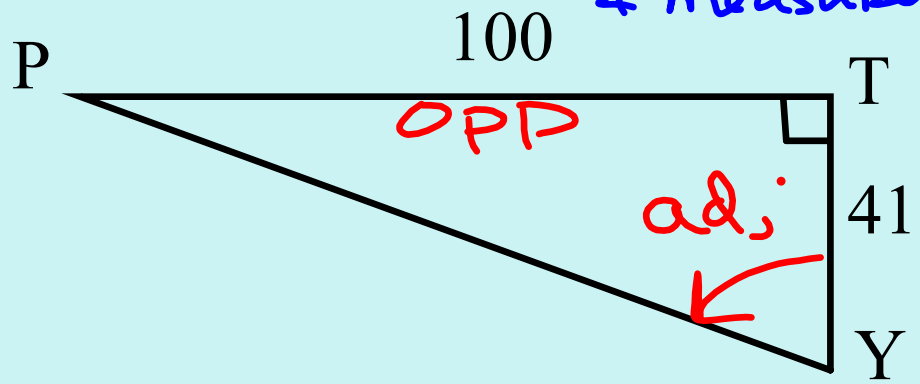
$w \tan 28 = \frac{1}{w}$ (w)

$\frac{w \tan 28}{\tan 28} = \frac{1}{\tan 28}$

$w = \frac{1}{\tan 28}$

$w \approx 1.9$

6. Find $m\angle Y$ to the nearest degree.



4 measurements

opp

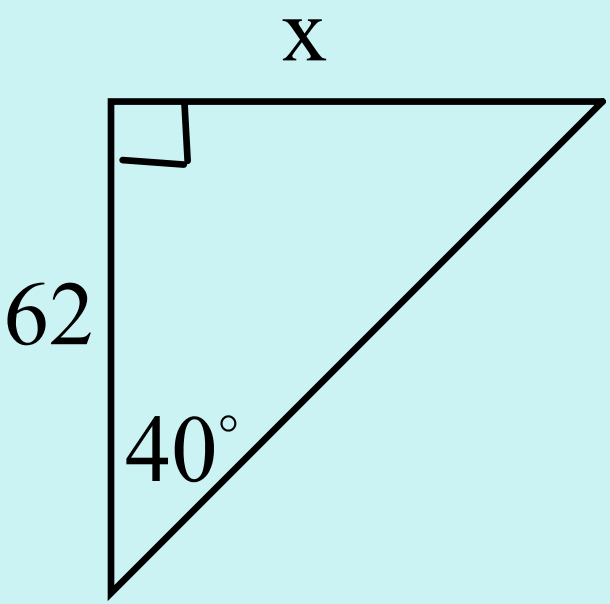
adj

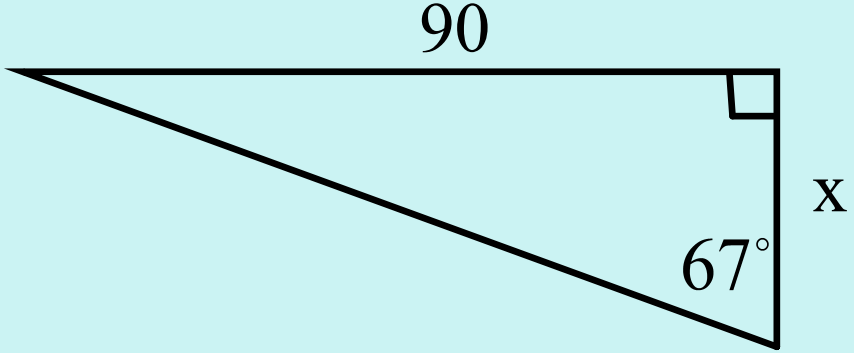
$\tan Y = \frac{100}{41}$

$Y = \tan^{-1}\left(\frac{100}{41}\right)$

$m\angle Y \approx 68^\circ$

7. Find x to the nearest whole number.





Assignment:

Day 1: 8.3 pgs 434-437 1-21 odds, 27,29,37,39,53,55,57