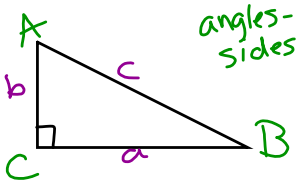
Applications of Right Triangles p. 62



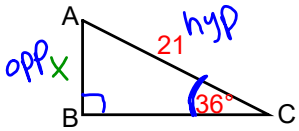
angles - capital
sides - lowercase

SOH-CAH-TOA

$\sin\theta = \frac{opp}{hyp}$ $\cos\theta = \frac{adj}{hyp}$ $\tan\theta = \frac{opp}{adj}$

Use right triangle trig to solve for missing values in the following:

1. Find AB (c)



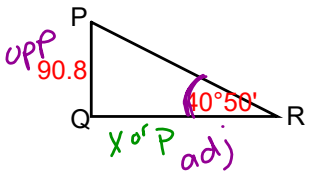
$\sin\theta = \frac{opp}{hyp}$

$\sin 36 = \frac{X}{21}$

$X = 21 \cdot \sin 36$

$X = 12.3$

2. Find QR (p)



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

$\tan 40°50' = \frac{90.8}{X}$

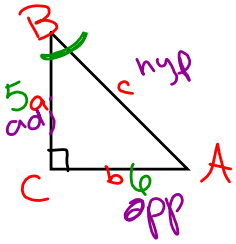
$\frac{90.8}{\tan 40°50'} = \frac{X \tan 40°50'}{\tan 40°50'}$

$X = 90.8 \div \tan 40°50'$

2nd Apps

$X = 105.1$

3. If a = 5 & b = 6, find m∠B to the nearest tenth.



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

$\tan B = \frac{6}{5}$

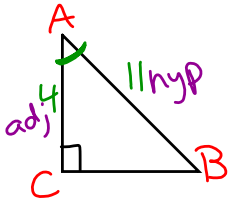
$B = \tan^{-1}\left(\frac{6}{5}\right)$

calc: 2nd Tan (6 ÷ 5)

$B = 50.2°$

* To solve for an angle, use inverses
$\sin^{-1}$
$\cos^{-1}$
$\tan^{-1}$

4. If b = 4 & c = 11, find m∠A to the nearest tenth.



$\cos\theta = \frac{adj}{hyp}$

$\cos A = \frac{4}{11}$

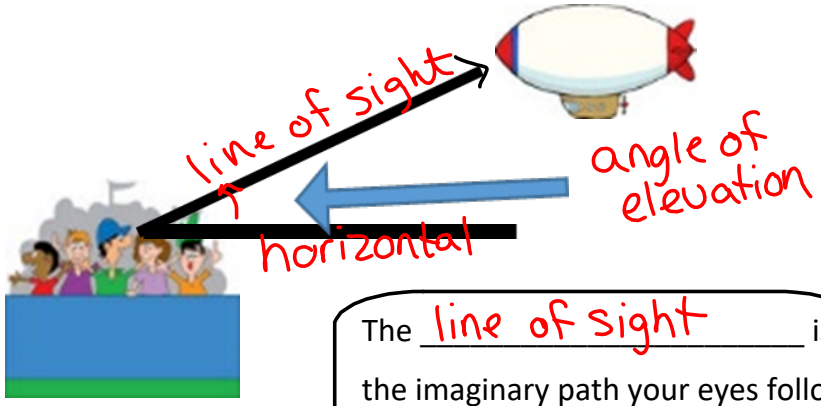
$A = \cos^{-1}\left(\frac{4}{11}\right)$

$A = 68.7°$

Oct 18-8:25 AM

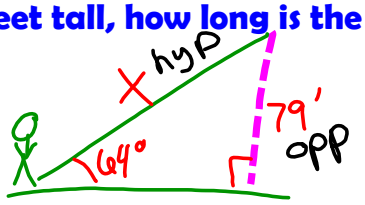
Angles of Elevation

An angle of elevation **is the angle between the** horizontal **&** line of sight **to an object when** looking up.



The line of sight is the imaginary path your eyes follow when looking at an object.

Ex #1: Lisa is standing at the bottom of a hill. The angle of elevation from her to the top of the hill is 64°. If the hill is 7 feet tall, how long is the path up the hill?

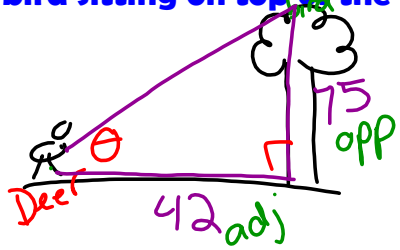


$$\frac{\sin 64^\circ}{1} = \frac{79}{x}$$

$$\frac{79}{\sin 64} = \frac{x \sin 64}{\sin 64}$$

$x = 87.9$ feet

Ex #2: A deer is standing 42 feet from the base of a 75 foot tall tree. What is the angle of elevation from the deer to a bird sitting on top of the tree?



$$\tan\theta = \frac{75}{42}$$

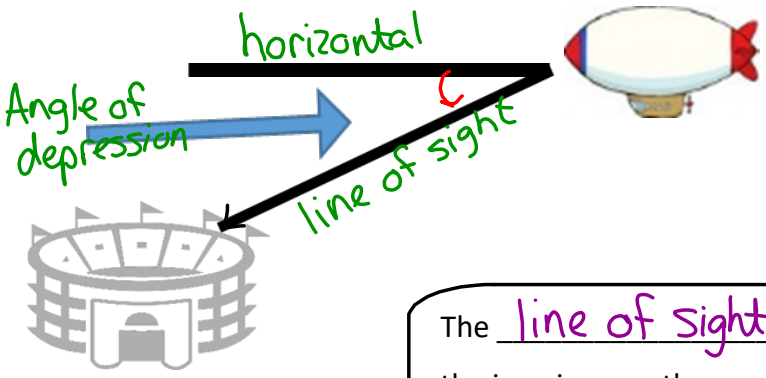
$$\theta = \tan^{-1}\left(\frac{75}{42}\right)$$

$\theta = 60.8^\circ$

Oct 18-9:03 AM

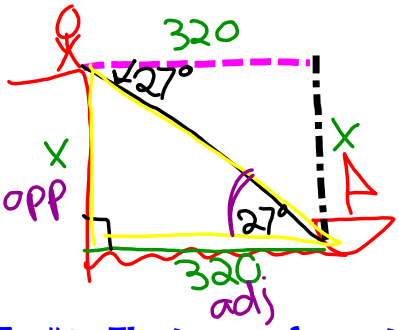
Angles of Depression

An angle of depression **is the angle between the** horizontal **& the** line of sight **to an object when** looking down



The **line of sight** is the imaginary path your eyes follow when looking at an object.

Ex #1: The angle of depression from a fisherman on top of a cliff to a boat 320 feet from the base of the cliff is 27°. How tall is the cliff?

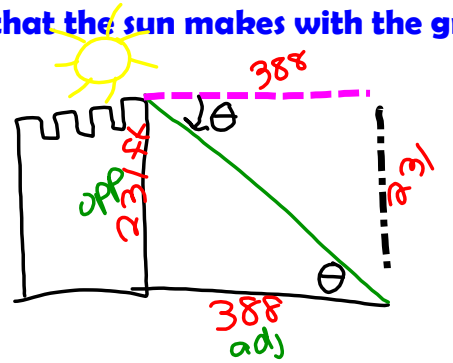


$\tan 27° = \frac{X}{320}$

$X = 320 \tan 27$

$X = 163 \text{ ft}$

Ex #2: The tower of a castle is 231 feet tall and casts a shadow that is 388 feet long. What is the angle of depression that the sun makes with the ground to create the shadow?



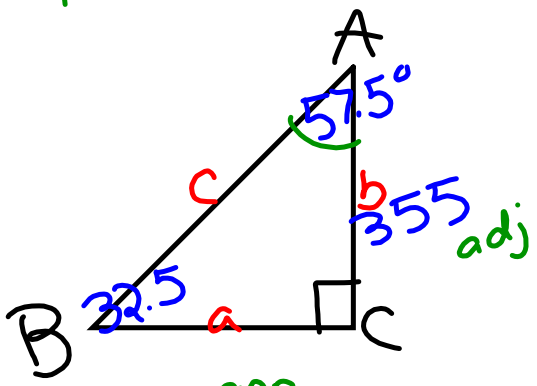
$\tan \theta = \frac{231}{388}$

$\theta = \tan^{-1}\left(\frac{231}{388}\right)$

$\theta = 30.8°$

Oct 18-9:15 AM

9. Solve (find all 3 sides & angles)



a=

b=355

c=

A=57.5°

B=32.5°

C=90°

B=180-90-57.5

$\tan 57.5 = \frac{a}{355}$

$a = 355 \tan 57.5$

a=

$\cos 57.5 = \frac{355}{c}$