



79: Trigonometry  
Geometry

2

11/30/15

ESSENTIAL QUESTION:

What are the special relationships between the sides and angles of right triangles?

QUESTIONS:

NOTES:

Trigonometry: translates to "the measure of triangles."

Trig for short. We will mostly look at trig ratios in this class (sine, cosine, tangent)

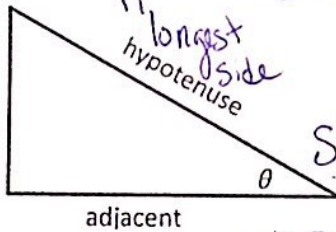
Trig ratios: A relationship between the sides and angles in a right triangle.

Sine ratio: sine of an angle,  $\theta$ , equals the opposite side divided by the hypotenuse.

Cosine ratio: cosine of an angle,  $\theta$ , equals the adjacent side divided by the hypotenuse.

Tangent ratio: tangent of an angle,  $\theta$ , equals the opposite side divided by the adjacent side.

across from  $\theta$   
opposite



SOH

CAH

TOA

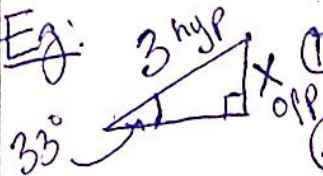
$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

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

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

next to the angle  $\theta$

Eg:



Solve for x.

① Label the sides as hyp, opp, adj.

② Decide which trig ratio to use - since we have hyp opp we'll use sine

③ set up equation  $3 \cdot \sin 33^\circ = \frac{x}{3} \cdot 3$

④ solve for x  $x = 3 \cdot \sin 33 \approx 1.63$

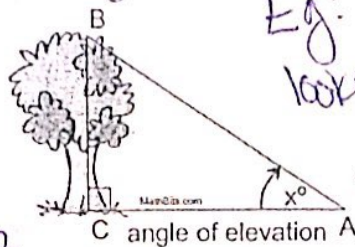
SUMMARY:

QUESTIONS:

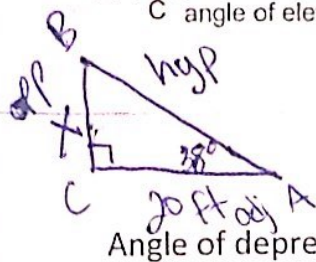
NOTES:

Angle of elevation: An upward angle from a horizontal line (usually the ground.) It is always inside the triangle.

\*Key word: elevate, to lift or raise up



Eg: A person sitting 20 ft from a tree looks up to the top of the tree with an angle of elevation of  $38^\circ$ . How tall is the tree?

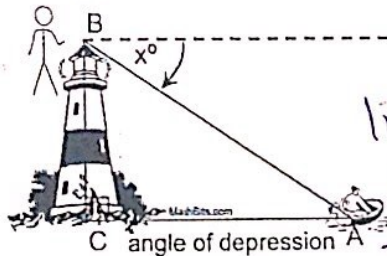


$$\tan 38^\circ = \frac{x}{20}$$

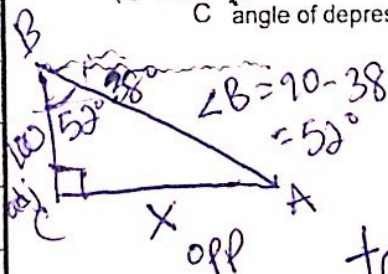
$$x = 20 \cdot \tan 38 \approx 15.625 \text{ ft}$$

Angle of depression: a downward angle made from a horizontal line parallel to the ground. It is always outside the triangle.

\*Key word: depress, to push down



Eg: A person at the top of a lighthouse looks at a boat with an angle of depression of  $38^\circ$ . If the lighthouse is 100 ft tall, how far away is the boat from the lighthouse?



$$\tan 52^\circ = \frac{x}{100}$$

$$x = 100 \cdot \tan 52^\circ \approx 127.99 \text{ ft}$$

SUMMARY: