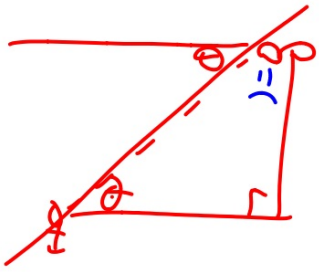
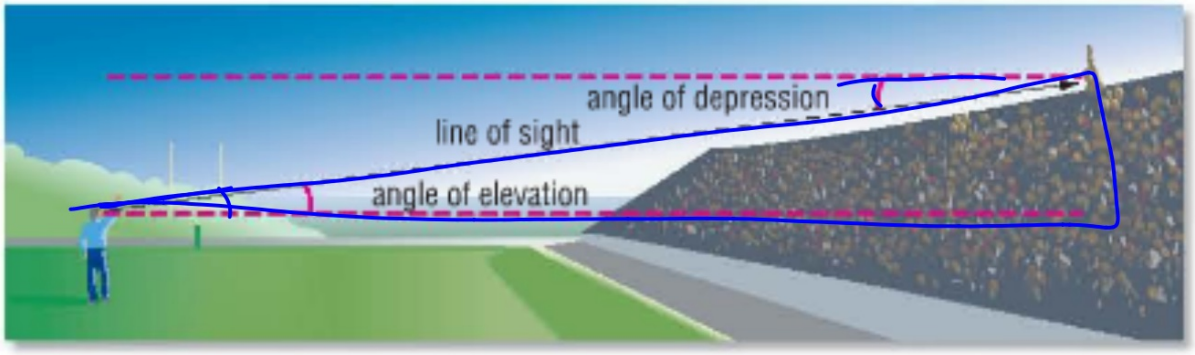
Geometry 8.5
Solve problems using angle of elevation
Solve problems using angle of depression
Use angles of elevation & depression to find distance between 2 objects

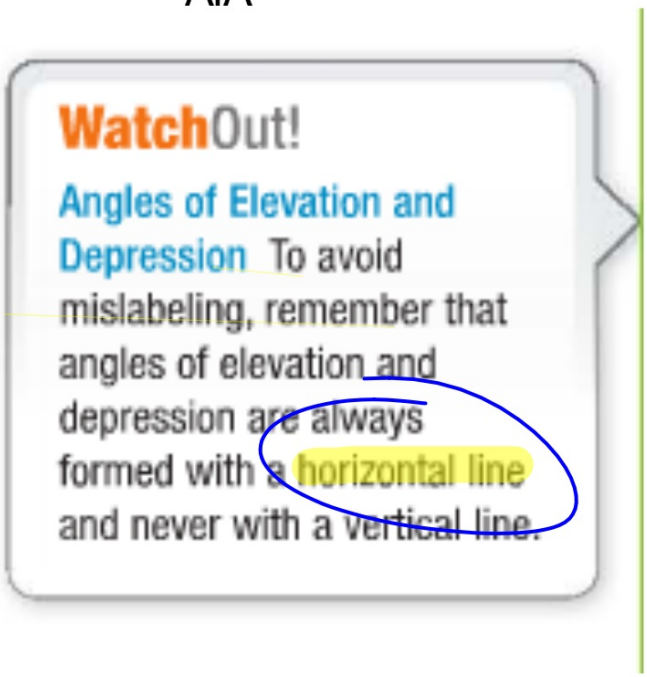
parallel lines
transversal
alternate interior angles
horizontal
vertical
angle of elevation
angle of depression
line of sight



Always measure from horizontal
Where are you?

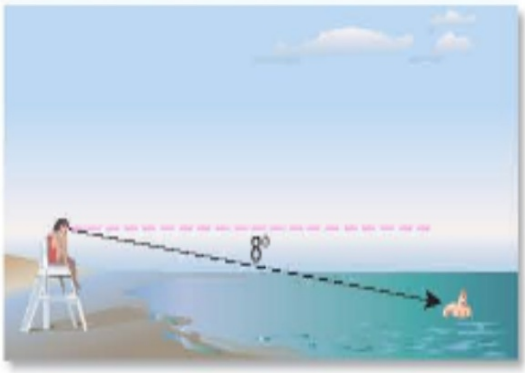


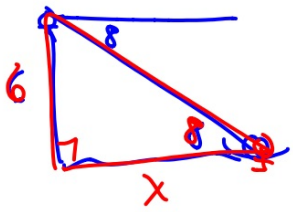
AIA


WatchOut!
Angles of Elevation and Depression To avoid mislabeling, remember that angles of elevation and depression are always formed with a horizontal line and never with a vertical line.

GuidedPractice

2. LIFEGUARDING A lifeguard is watching a beach from a line of sight 6 feet above the ground. She sees a swimmer at an angle of depression of 8°. How far away from the tower is the swimmer?





$\text{Tan} = \frac{\text{opp}}{\text{adj}}$

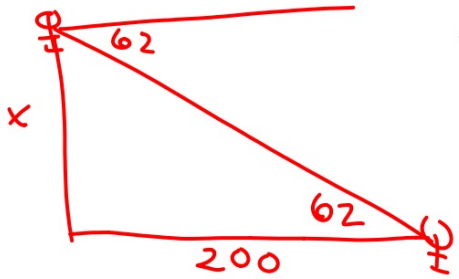
$\frac{\tan 8}{1} = \frac{6}{x}$

$0.1405x = 6$

$x = 42.7 \text{ ft}$

43 ft

2. BASEBALL A fan is seated in the upper deck of a stadium 200 feet away from home plate. If the angle of depression to the field is 62°, at what height is the fan sitting?



$$\tan 62 = \frac{x}{200}$$

$$x = 376.1$$

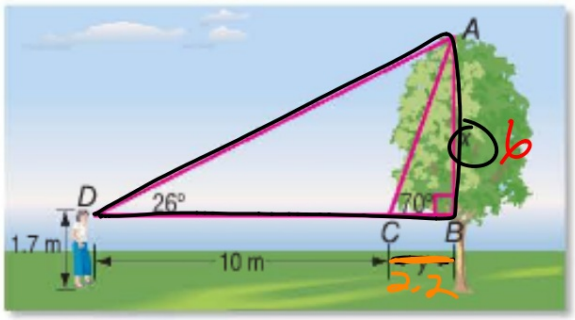
tough!

6 + 1.7 = 7.7 m

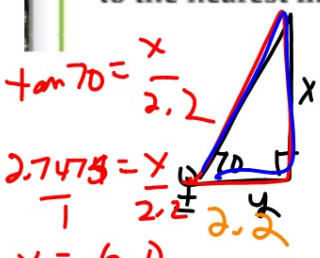
X + 1.7 =

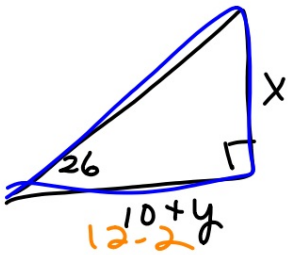
Example 3 Use Two Angles of Elevation or Depression

TREE REMOVAL To estimate the height of a tree she wants removed, Mrs. Long sights the tree's top at a 70° angle of elevation. She then steps back 10 meters and sights the top at a 26° angle. If Mrs. Long's line of sight is 1.7 meters above the ground, how tall is the tree to the nearest meter?



Eyeball height:





$\tan 70 = \frac{x}{2.2}$

$2.7475 = \frac{x}{2.2}$

$x = 6.0$

$\tan 70 = \frac{x}{y}$

$2.7475y = x$

$\tan 26 = \frac{x}{10+y}$

$0.4877(10+y) = x$

$4.877 + 0.4877y = x$

$2.7475y = 4.877 + 0.4877y$

$-0.4877y \quad -0.4877y$

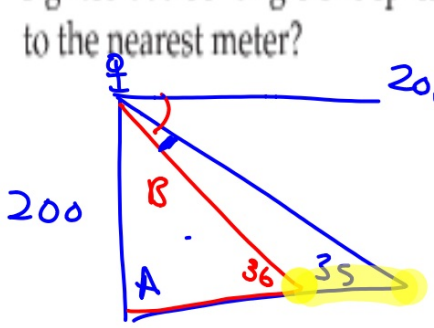
$2.2598y = 4.877$

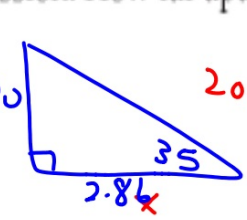
$y = 2.2$

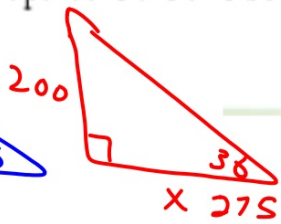
$(\overset{A}{286}) - (\overset{B}{275}) = 11\text{ m}$

GuidedPractice

3. SKYSCRAPERS Two buildings are sited from atop a 200-meter skyscraper. Building A is sited at a 35° angle of depression, while Building B is sighted at a 36° angle of depression. How far apart are the two buildings to the nearest meter?







$\tan 35 = \frac{200}{x}$

$x(0.7002) = 200$

$x = 286$

Assume same line of sight

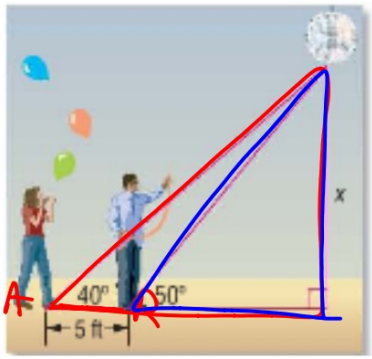
$\tan 36 = \frac{200}{x}$

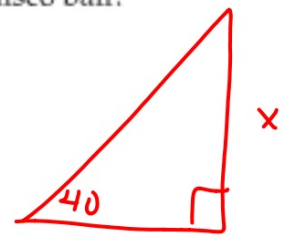
$x(0.7265) = 200$

$x = 275$

$x =$

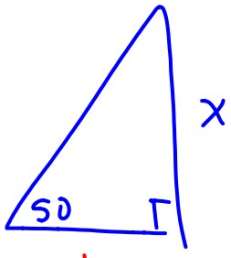
3. CCSS **MODELING** Annabelle and Rich are setting up decorations for their school dance. Rich is standing 5 feet directly in front of Annabelle under a disco ball. If the angle of elevation from Annabelle to the ball is 40° and Rich to the ball is 50°, how high is the disco ball?





$y + 5$

$\tan 40 = \frac{x}{y+5}$



y

$\tan 50 = \frac{x}{y}$