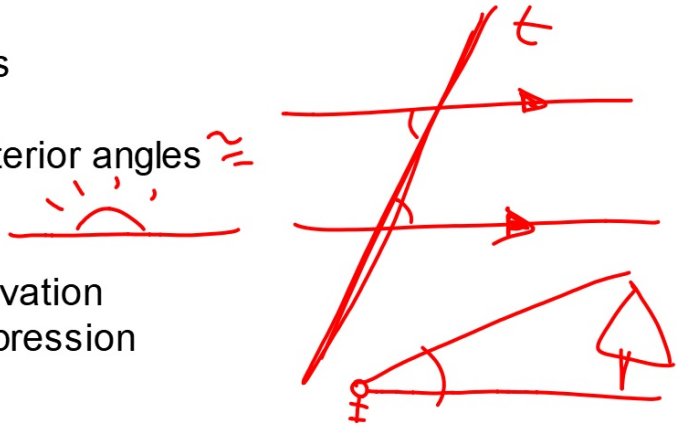
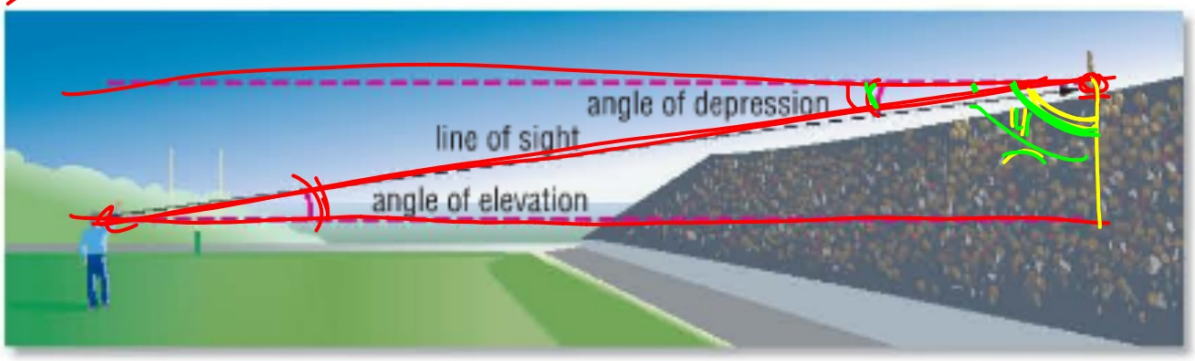
Geometry 8.5
Solve problems using angle of elevation
Solve problems using angle of depression
Use angles of elevation & depression to find distance between 2 objects

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



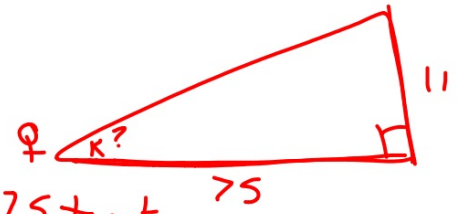
Quiz 8.3-8.4
Wed.

Always measure from horizontal
Where are you?



GuidedPractice

1. **FOOTBALL** The cross bar of a goalpost is 10 feet high. If a field goal attempt is made 25 yards from the base of the goalpost that clears the goal by 1 foot, what is the smallest angle of elevation at which the ball could have been kicked to the nearest degree?



$\tan = \frac{O}{A}$

$\tan K = \frac{11}{75}$

$\frac{11}{75} = \frac{75 \tan K}{75}$

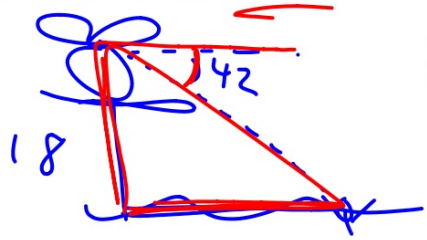
$0.1467 = \tan K$

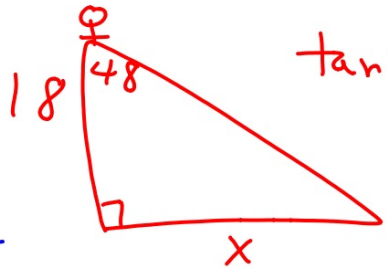
$8° = K$

SohCahToa

Example 2 Angle of Depression

EMERGENCY A search and rescue team is airlifting people from the scene of a boating accident when they observe another person in need of help. If the angle of depression to this other person is 42° and the helicopter is 18 feet above the water, what is the horizontal distance from the rescuers to this person to the nearest foot?





$\tan 48 = \frac{x}{18}$

$x = 18(1.1106)$

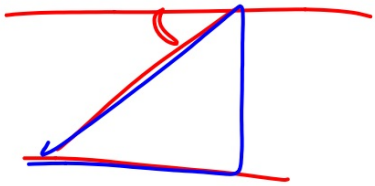
$x = 19.99$

20ft

AIA

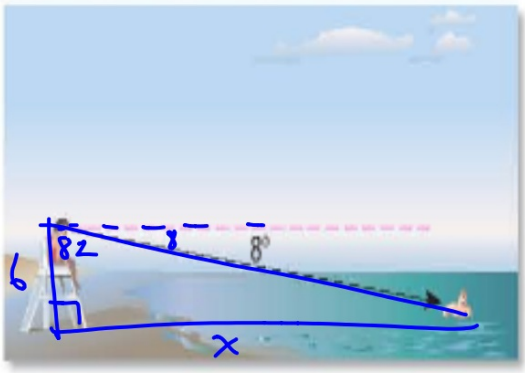
WatchOut!

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.



Guided Practice SohCahToa

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?



$\tan 82 = \frac{x}{6}$

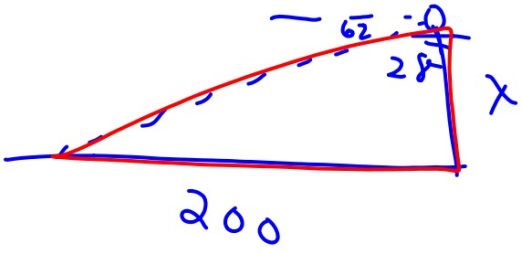
$x = 6(7.1154)$

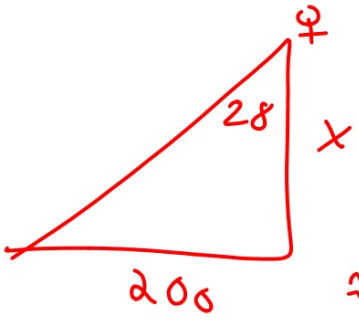
42.6922837

42.7 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?





$\tan 28 = \frac{200}{x}$

$200 = x(0.5317)$

≈ 376 ft

tough: better have a plan

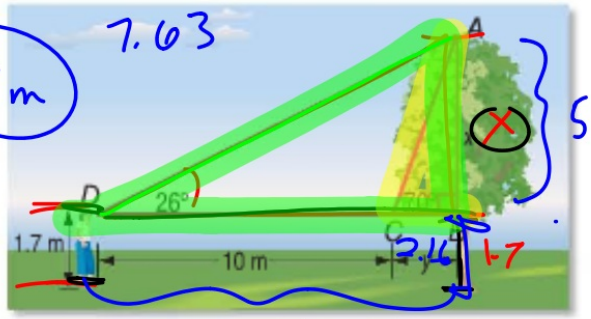
(x) + 1.7

Example 3 Use Two Angles of Elevation or Depression

5.93 + 1.7

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?

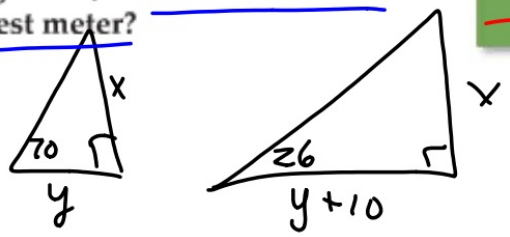
8 m



12.16

Eyeball height:

To



$\tan 26 = \frac{x}{12.16}$

$x = 5.93$

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

$x = y(2.7475)$

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

$x = (0.4877)(y+10)$

$x = 0.4877y + 4.877$

$2.7475y = 0.4877y + 4.877$

$-0.4877y \quad -0.4877y$

$2.2598y = 4.877$

$y = 2.16$

8.5 p583
5-13, 16, 17, 32-37

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?

Assume same line of sight

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?