Geometry 8.5 AIA ≅

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

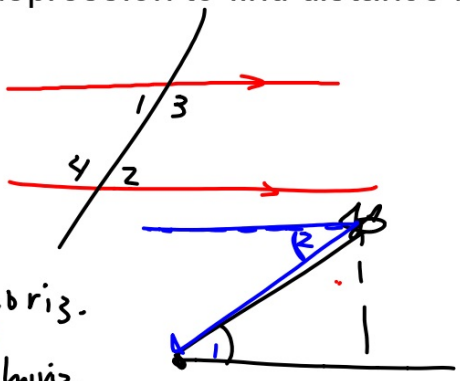
horizontal

vertical

∠1 angle of elevation up from horiz. = AIA

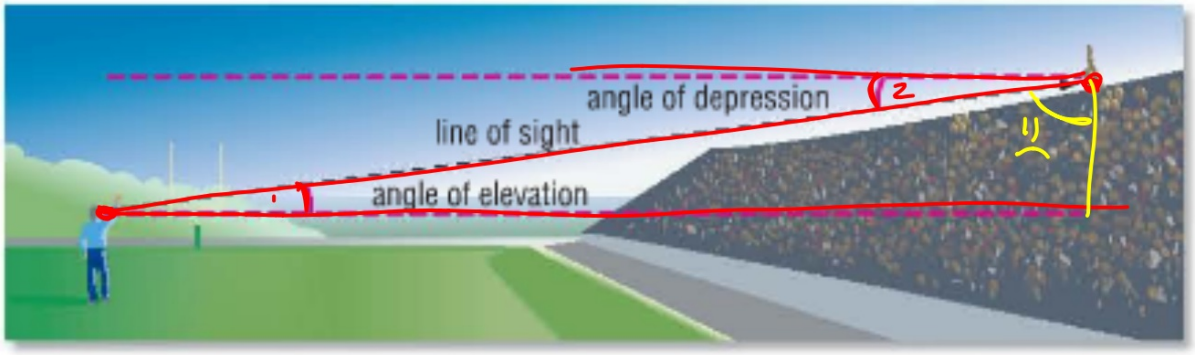
∠2 angle of depression down from horiz.

line of sight



Quiz 8.3-8.4

Always measure from horizontal
Where are you?



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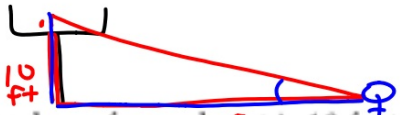
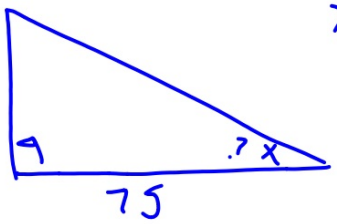


1. **FOOTBALL** The cross bar of a goalpost is 10 feet high. If a field goal attempt is made 25 yards from the base of the goalpost that clears the goal by 1 foot, what is the smallest angle of elevation at which the ball could have been kicked to the nearest degree?

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

$\tan^{-1} x =$

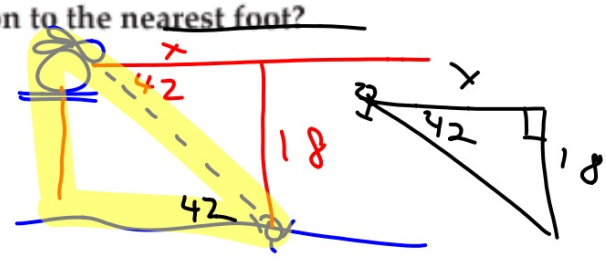


$x = 8°$

8.5 p. 583 5-11 odd

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?



$\tan 42 = \frac{18}{x}$

$x(0.9004) = 18$

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.

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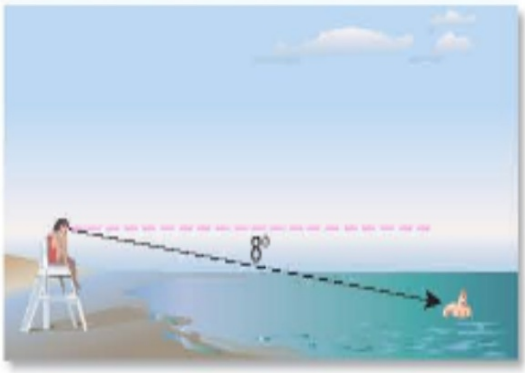
2. LIFEGUARDING A lifeguard is watching a beach from a line of sight 6 feet above the ground. She sees a swimmer at an angle of depression of 8°. How far away from the tower is the swimmer?

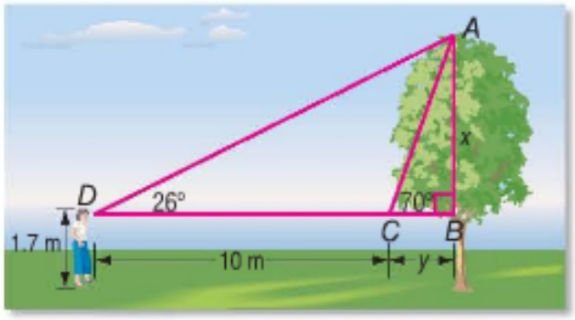


2. **BASEBALL** A fan is seated in the upper deck of a stadium 200 feet away from home plate. If the angle of depression to the field is 62°, at what height is the fan sitting?

tough!

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:

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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?