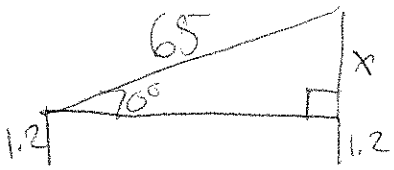
Name Key Date

Angle of Elevation & Depression Trig Worksheet

***Draw and label a picture for each problem**

1. Brian's kite is flying above a field at the end of 65 m of string. If the angle of elevation to the kite measures 70°, and Brian is holding the kite 1.2 m off the ground. How high above the ground is the kite flying?



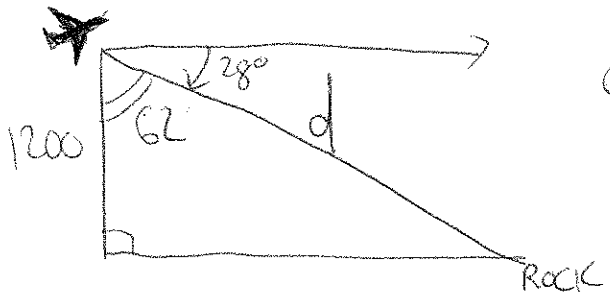
$\sin 70 = \frac{x}{65}$

$x = 65 \sin 70$

$x = 61.08 + 1.2$

$x = 62.28$

2. From an airplane at an altitude (height) of 1200 m, the angle of depression to a rock on the ground measures 28°. Find the distance from the plane to the rock.

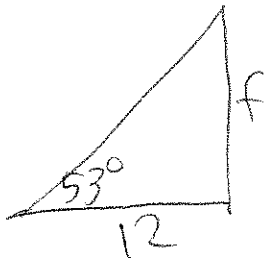


$\cos 62 = \frac{1200}{d}$

$d = \frac{1200}{\cos 62}$

$d = 2,556.1 \text{ ft}$

3. From a point on the ground 12 ft from the base of a flagpole, the angle of elevation of the top of the pole measures 53°. How tall is the flagpole?

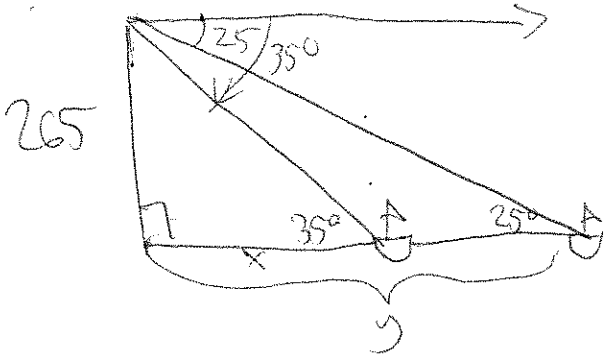


$\tan 53 = \frac{f}{12}$

$12 \tan 53 = f$

$f = 15.9 \text{ ft}$

4. From a plane flying due east at 265 m above sea level, the angles of depression of two ships sailing due east measure 35° and 25 °. How far apart are the ships?



$\tan 35 = \frac{265}{x}$ $\quad \tan 25 = \frac{265}{y}$

$x = \frac{265}{\tan 35}$ $\quad y = \frac{265}{\tan 25}$

$x = 378.5$ $\quad y = 568.3$

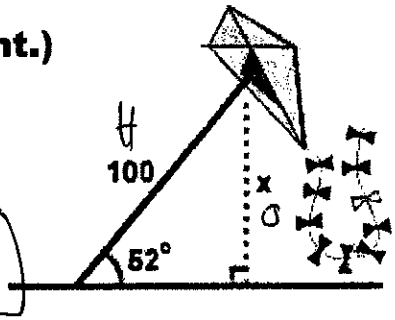
189.8

Name_____ Date_____

Angle of Elevation & Depression Worksheet (Cont.)

Find all values to the nearest tenth.

5. A man flies a kite with a 100 foot string. The angle of elevation of the string is 52°. How high off the ground is the kite?

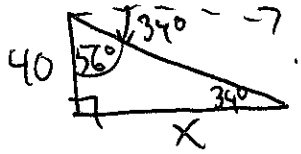


$\sin 52 = \frac{x}{100}$

$100 \sin 52 = x$

78.8 ft

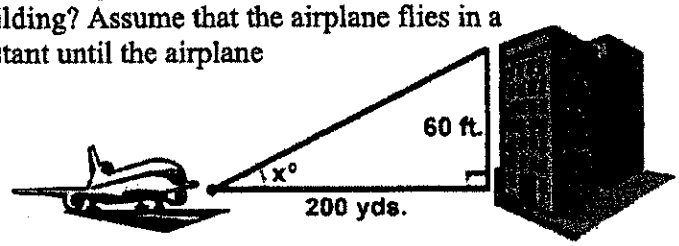
6. From the top of a vertical cliff 40 m high, the angle of depression of an object that is level with the base of the cliff is 34°. How far is the object from the base of the cliff?



$\tan 56 = \frac{x}{40}$

$x = 59.3\text{m}$

7. An airplane takes off 200 yards in front of a 60 foot building. At what angle of elevation must the plane take off in order to avoid crashing into the building? Assume that the airplane flies in a straight line and the angle of elevation remains constant until the airplane flies over the building.



$\tan x = \frac{60}{200}$

$\tan^{-1} \quad \tan^{-1}\left(\frac{60}{200}\right)$

$x = 16.7°$

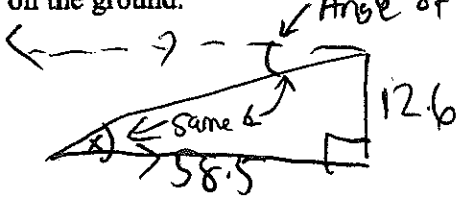
8. A 14 foot ladder is used to scale a 13 foot wall. At what angle of elevation must the ladder be situated in order to reach the top of the wall?

$\sin x = \frac{13}{14}$

$\sin^{-1} \quad x = \sin^{-1}\left(\frac{13}{14}\right)$

$x = 68.2°$

9. A person stands at the window of a building so that his eyes are 12.6 m above the level ground. An object is on the ground 58.5 m away from the building on a line directly beneath the person. Compute the angle of depression of the person's line of sight to the object on the ground.

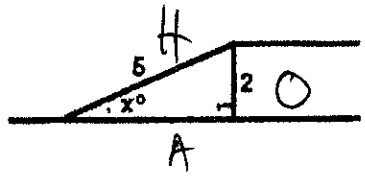


$\tan x = \frac{12.6}{58.5}$ $\quad x = 12.2°$

$\tan^{-1} \quad \tan^{-1}$

$x = \tan^{-1}\left(\frac{12.6}{58.5}\right)$

10. A ramp is needed to allow vehicles to climb a 2 foot wall. The angle of elevation in order for the vehicles to safely go up must be 30° or less, and the longest ramp available is 5 feet long. Can this ramp be used safely?



$\sin x = \frac{2}{5}$

$\sin^{-1} \quad \sin^{-1}$

$x = \sin^{-1}\left(\frac{2}{5}\right)$

$x = 23.58° < 30°$ so, Yes!