

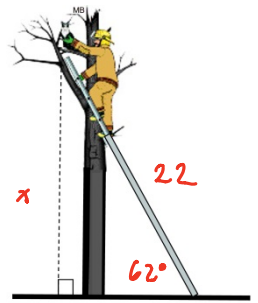
# Trigonometry in Action!

Name \_\_\_\_\_

*Directions:* Label the diagrams, set up the trigonometric equations, and show work. Round answers to the *nearest integer* or the *nearest degree*.

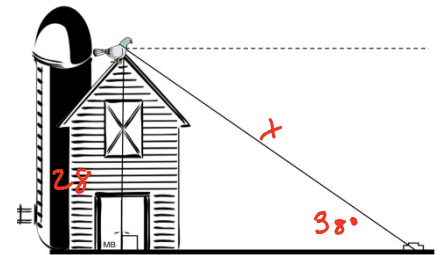
1. Mrs. O'Leary's cat is stuck in her backyard tree. A fireman positions a ladder against the tree branch and rescues the cat. The ladder was extended to 22 feet, and made an angle of  $62^\circ$  with the ground. What was the cat's vertical height in the tree?

$$\sin 62^\circ = \frac{x}{22} \quad \boxed{x = 19}$$



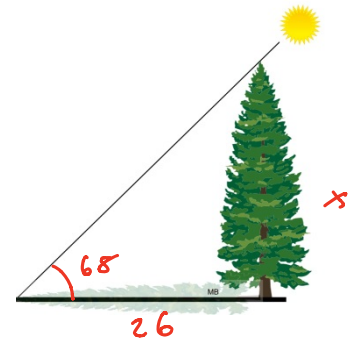
2. From the top of a barn, a pigeon spies a pile of bird seed on the ground. The angle of depression of the seed is  $38^\circ$ . The height of the barn is 28 feet. Find the distance from the pigeon to the seed.

$$\sin(38) = \frac{28}{x} \quad \boxed{x = 45}$$



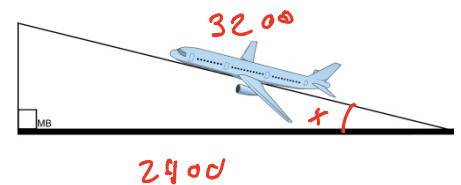
3. A tree casts a shadow 26 feet long when the angle of elevation of the sun is  $68^\circ$ . Find the height of the tree.

$$\tan 68 = \frac{x}{26} \quad \boxed{x = 64}$$



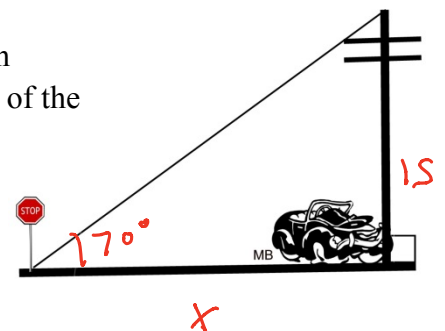
4. A plane takes off from LAX airport and ascends for a distance of 3200 feet. If the plane traveled 2400 feet horizontally, find the plane's angle of elevation at take-off.

$$\cos x = \frac{2400}{3200} \quad \boxed{x = 41}$$



5. When attempting to stop at a stop sign on an icy road, Jerome slid through the intersection into a nearby 15-foot telephone pole. The angle of elevation of the telephone pole from the bottom of the stop sign was  $70^\circ$ . How far did Jerome's car slide from the stop sign to the telephone pole?

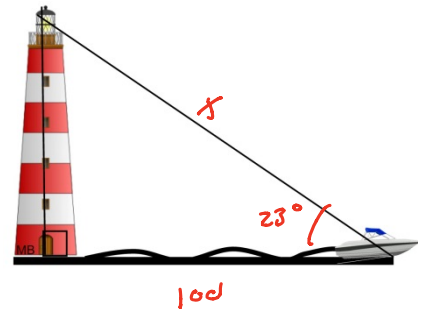
$$\tan 70 = \frac{15}{x} \quad \boxed{x = 5}$$



6. From the top of a lighthouse, the angle of depression of a speed boat is  $23^\circ$ . The boat is 100 meters from the base of the lighthouse. Find the distance from the top of the lighthouse to the boat.

$$\cos 23 = \frac{100}{x}$$

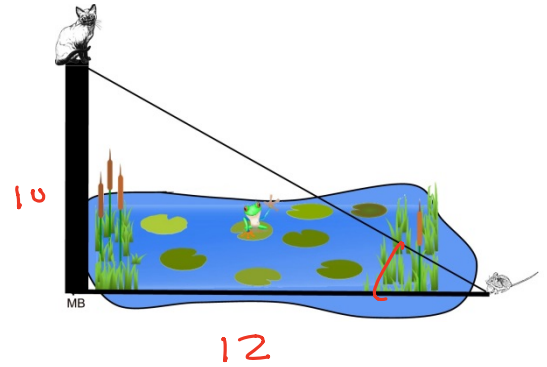
$$x = 109$$



7. From the top of a post, Felix, the cat, sees a mouse across a small pond. The post is 10 feet tall and the width of the pond is 12 feet. Find the angle of elevation of the top of the post from the mouse's location.

$$\tan X = \frac{10}{12}$$

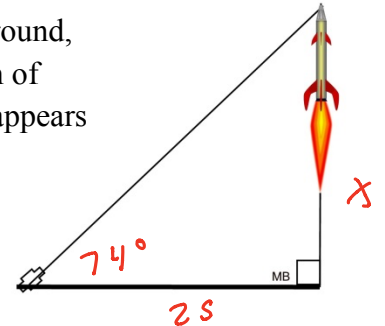
$$x = 40$$



8. From the ground, a rocket is fired vertically into the air. A camera, on the ground, 25 feet from the launch point is angled at  $74^\circ$  with the horizontal in the direction of the rocket. At this angle, how high will the rocket have traveled when its nose appears in the camera's window?

$$\tan 74 = \frac{x}{25}$$

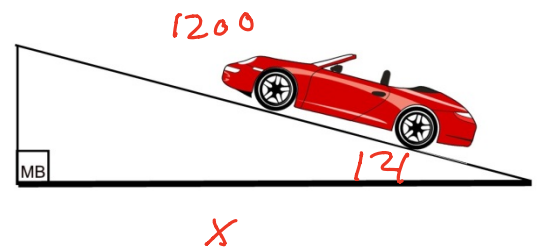
$$x = 87$$



9. A car travels along a hill inclined  $12^\circ$  with the horizontal for a distance of 1200 feet. What is the horizontal distance traveled by the car during this time?

$$\cos(12) = \frac{x}{1200}$$

$$x = 1173$$



10. From the top of the Ferris wheel, the angle of depression of your friend on the ground is  $61^\circ$ . If your friend is standing 30 feet from the foot of the ride, how tall is the Ferris wheel?

$$\tan 61 = \frac{x}{30}$$

$$x = 54$$

