

# Trigonometry – Applications

G.SRT.C.8

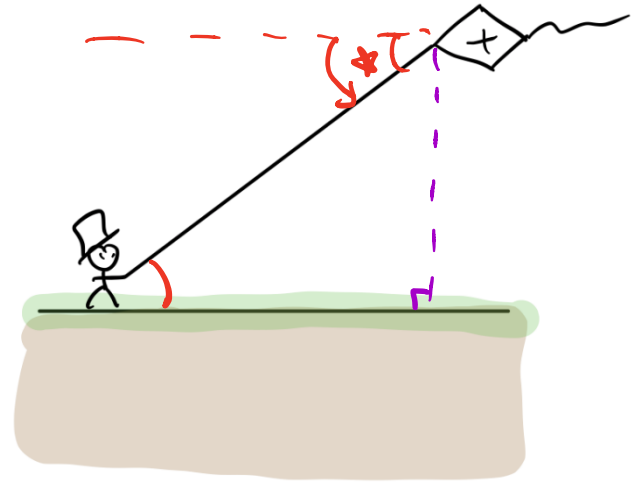
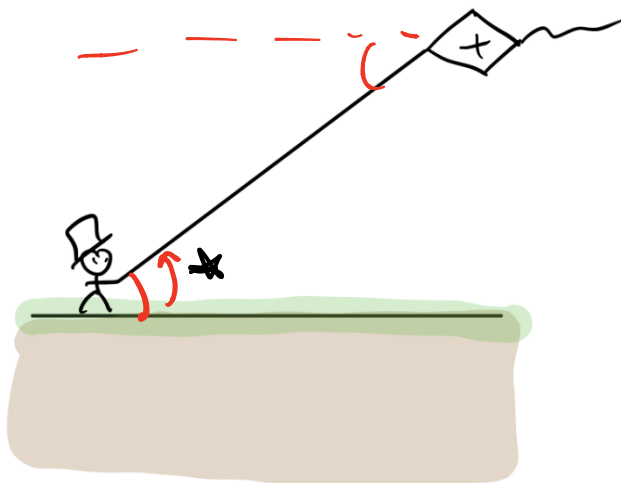
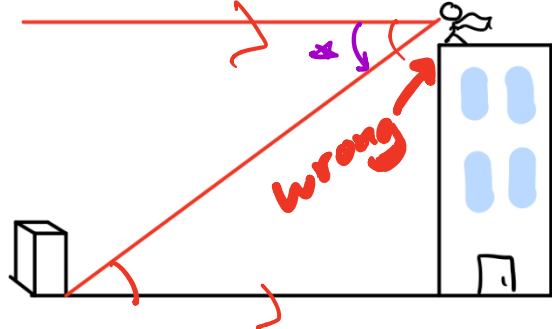
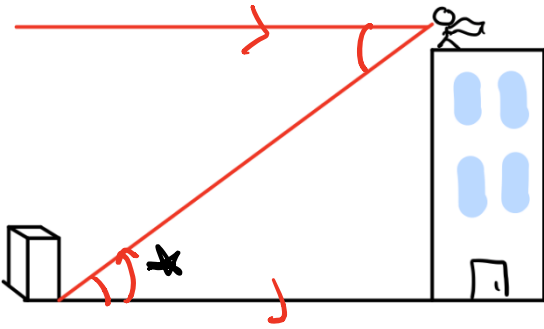
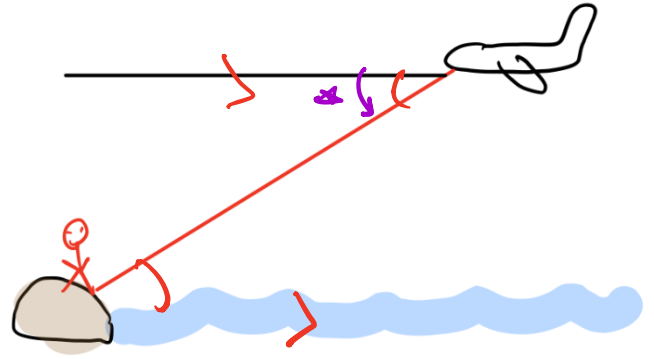
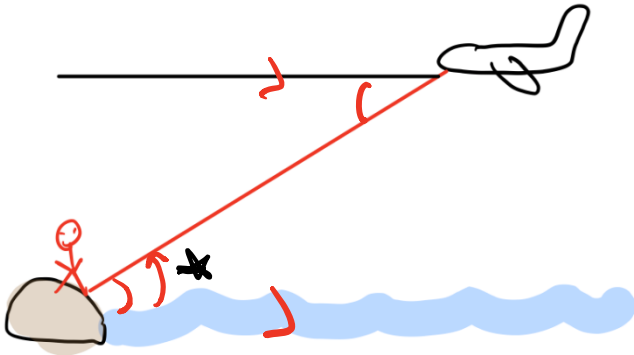
Notes Section 9.3

Name \_\_\_\_\_

Angle of Elevation = This type of angle starts at a HORIZONTAL line and ELEVATES to form an angle.

Always

Angle of Depression = This type of angle starts at a HORIZONTAL line and DEPRESSES to form an angle.



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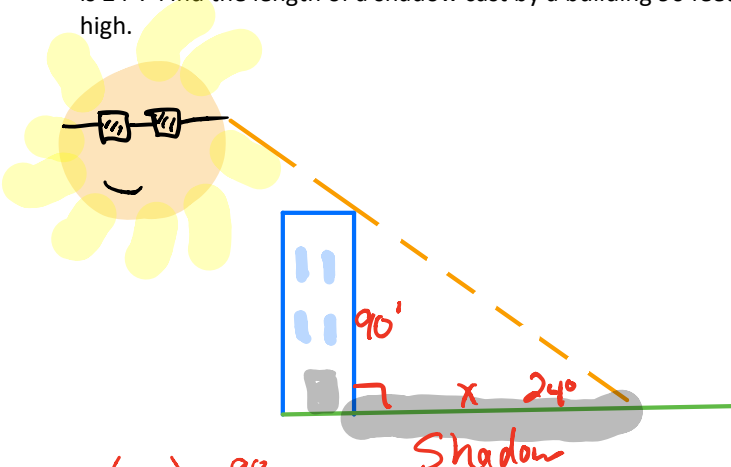
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Notes Section 9.3

Name \_\_\_\_\_

Solve each problem. If needed, round measures of segments to the nearest hundredth and measures of angles to the nearest degree. You must draw a picture.

#1) At a certain time of day, the angle of elevation of the sun is  $24^\circ$ . Find the length of a shadow cast by a building 90 feet high.



$$\tan(24^\circ) = \frac{90}{x}$$

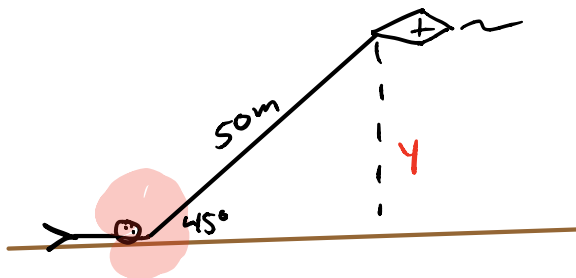
$$x \cdot \tan(24^\circ) = 90$$

$$x = \frac{90}{\tan(24^\circ)}$$

$$x \approx 202.1 \text{ feet}$$

The shadow is about 202.1 feet long.

#2) Narcoleptic Nelly is flying a kite while taking a nap. The string is 50 meters long and forms an angle of  $45^\circ$  with the ground. How high is the kite above the ground?



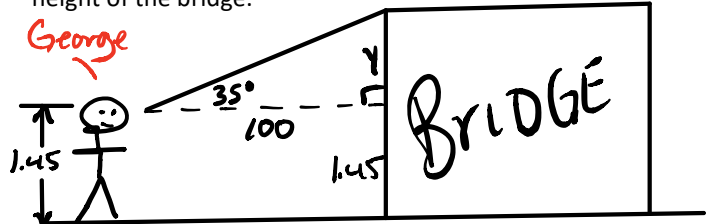
$$\sin(45^\circ) = \frac{y}{50}$$

$$50 \sin(45^\circ) = y$$

$$35.4 \approx y$$

The kite is about 35.4 meters high.

#3) George decides to take all his headless dolls and chuck them into a river. He wants to make sure that when the dolls hit the water's surface they become totally submerged in the river water, so he intends on climbing to the very top of a bridge. So George sets out to find an appropriate bridge to hurl his headless dolls off. Upon walking somewhat aimlessly in search of a bridge that is just right, George finds himself standing 100 meters from a bridge made of ginger bread and honey. "Mmmm, ginger bread and honey," George mumbles to himself. From his standing position, he determines that the angle of elevation to the top of the delicious bridge is  $35^\circ$ . George's eye level is 1.45 meters above the ground. Find the height of the bridge.



$$\tan 35^\circ = \frac{y}{100}$$

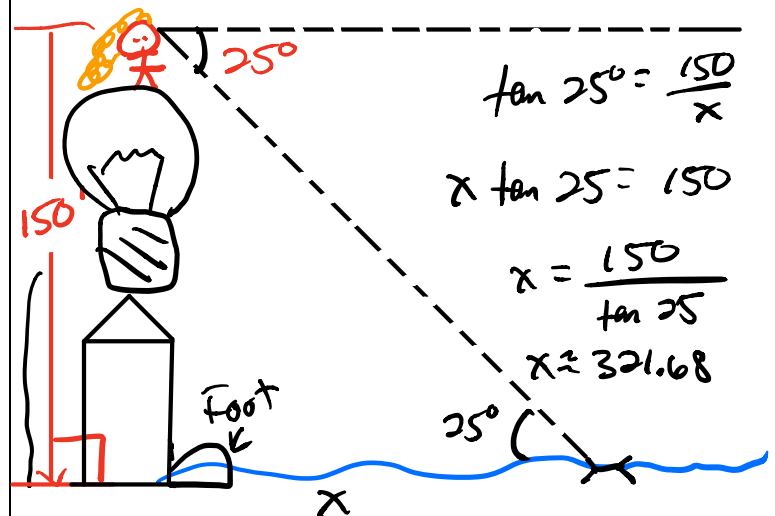
$$100 \tan 35^\circ = y$$

$$70.02 \approx y$$

$$\begin{aligned} \text{Bridge} &= y + 1.45 \\ &= 70.02 + 1.45 \\ &= 71.47 \end{aligned}$$

The bridge is about 71.47 meters tall.

#4) From the top of a lighthouse Hazel Nut can see something floating in the open sea. Using her binoculars, she can clearly see that the floating object is in fact a floating, headless doll. The angle of depression to the floating, headless doll is  $25^\circ$ . If the top of the lighthouse is 150 feet above sea level, find the distance from the doll to the foot of the lighthouse.



$$\tan 25^\circ = \frac{150}{x}$$

$$x \tan 25^\circ = 150$$

$$x = \frac{150}{\tan 25^\circ}$$

$$x \approx 321.68$$

The doll is about 321.68 feet to the foot of the lighthouse