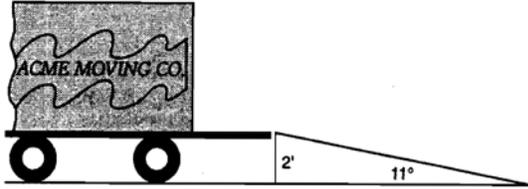


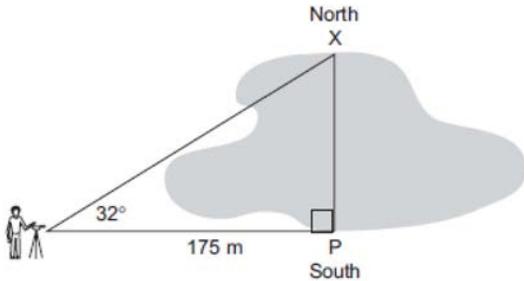
**G.SRT.C.8: Using Trigonometry to Find a Side 3**

- The tailgate of a truck is 2 feet above the ground. The incline of a ramp used for loading the truck is  $11^\circ$ , as shown below.

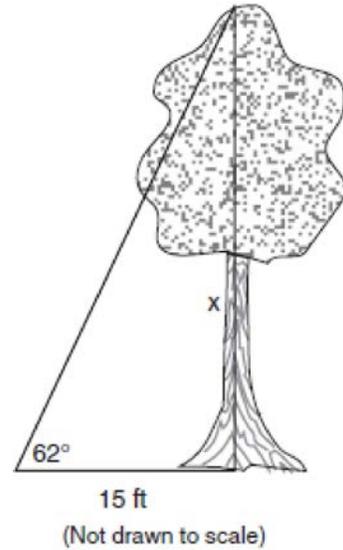


Find, to the *nearest tenth of a foot*, the length of the ramp.

- A surveyor needs to determine the distance across the pond shown in the accompanying diagram. She determines that the distance from her position to point  $P$  on the south shore of the pond is 175 meters and the angle from her position to point  $X$  on the north shore is  $32^\circ$ . Determine the distance,  $PX$ , across the pond, rounded to the *nearest meter*.



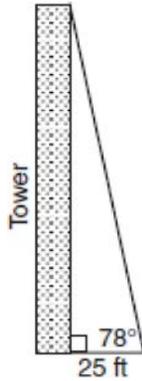
- Find, to the *nearest tenth of a foot*, the height of the tree represented in the accompanying diagram.



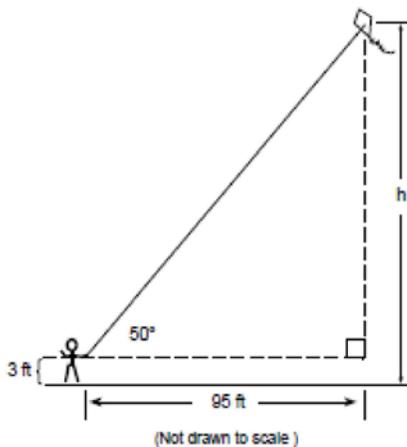
- In the accompanying diagram, a ladder leaning against a building makes an angle of  $58^\circ$  with level ground. If the distance from the foot of the ladder to the building is 6 feet, find, to the *nearest foot*, how far up the building the ladder will reach.



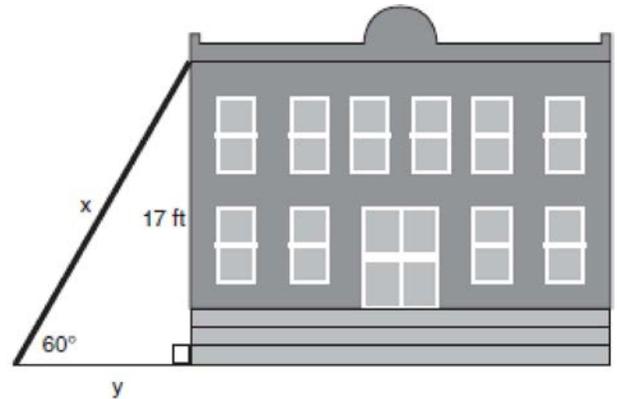
- 5 From a point on level ground 25 feet from the base of a tower, the angle of elevation to the top of the tower is  $78^\circ$ , as shown in the accompanying diagram. Find the height of the tower, to the nearest tenth of a foot.



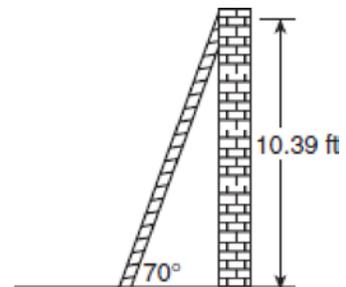
- 6 Joe is holding his kite string 3 feet above the ground, as shown in the accompanying diagram. The distance between his hand and a point directly under the kite is 95 feet. If the angle of elevation to the kite is  $50^\circ$ , find the height,  $h$ , of his kite, to the nearest foot.



- 7 In the accompanying diagram,  $x$  represents the length of a ladder that is leaning against a wall of a building, and  $y$  represents the distance from the foot of the ladder to the base of the wall. The ladder makes a  $60^\circ$  angle with the ground and reaches a point on the wall 17 feet above the ground. Find the number of feet in  $x$  and  $y$ .



- 8 As shown in the accompanying diagram, a ladder is leaning against a vertical wall, making an angle of  $70^\circ$  with the ground and reaching a height of 10.39 feet on the wall. Find, to the nearest foot, the length of the ladder. Find, to the nearest foot, the distance from the base of the ladder to the wall.



- 9 Draw and label a diagram of the path of an airplane climbing at an angle of  $11^\circ$  with the ground. Find, to the *nearest foot*, the ground distance the airplane has traveled when it has attained an altitude of 400 feet.
- 10 A tree casts a shadow that is 20 feet long. The angle of elevation from the end of the shadow to the top of the tree is  $66^\circ$ . Determine the height of the tree, to the *nearest foot*.
- 11 A person measures the angle of depression from the top of a wall to a point on the ground. The point is located on level ground 62 feet from the base of the wall and the angle of depression is  $52^\circ$ . How high is the wall, to the nearest tenth of a foot?
- 12 A 10-foot ladder is to be placed against the side of a building. The base of the ladder must be placed at an angle of  $72^\circ$  with the level ground for a secure footing. Find, to the *nearest inch*, how far the base of the ladder should be from the side of the building *and* how far up the side of the building the ladder will reach.
- 13 A ship on the ocean surface detects a sunken ship on the ocean floor at an angle of depression of  $50^\circ$ . The distance between the ship on the surface and the sunken ship on the ocean floor is 200 meters. If the ocean floor is level in this area, how far above the ocean floor, to the *nearest meter*, is the ship on the surface?
- 14 A parcel of land is in the shape of an isosceles triangle. The base has a length of 673 feet and the two equal legs meet at an angle of  $43^\circ$ . Find, to the *nearest square foot*, the area of the parcel of land.

### G.SRT.C.8: Using Trigonometry to Find a Side 3 Answer Section

1 ANS:

$$10.5. \quad \sin 11 = \frac{2}{x}$$

$$x \approx 10.5$$

REF: spring9825a

2 ANS:

$$109. \quad \tan 32 = \frac{\text{opposite}}{175}$$

$$\text{opposite} \approx 109$$

REF: 060030a

3 ANS:

$$28.2. \quad \tan 62 = \frac{x}{15}$$

$$x \approx 28.2$$

REF: 010135a

4 ANS:

$$10. \quad \tan 58 = \frac{\text{opposite}}{6}$$

$$\text{opposite} \approx 10$$

REF: 010531a

5 ANS:

$$117.6. \quad \tan 78 = \frac{\text{opposite}}{25}$$

$$\text{opposite} \approx 117.6$$

REF: 010735a

6 ANS:

$$116. \quad \tan 50 = \frac{\text{opposite}}{95} \quad h \approx 113 + 3 \approx 116$$

$$\text{opposite} \approx 113$$

REF: 069934a

7 ANS:

$$x = 19.6 \text{ and } y = 9.8. \quad \sin 60 = \frac{17}{x} \quad \tan 60 = \frac{17}{y}$$

$$x \approx 19.6 \quad y \approx 9.8$$

REF: 080231a

8 ANS:

Length of ladder = 11 and distance from the base of the ladder to the wall = 4.

$$\sin 70 = \frac{10.39}{\text{hypotenuse}}$$

$$\text{hypotenuse} \approx 11$$

$$\tan 70 = \frac{10.39}{\text{adjacent}}$$

$$\text{adjacent} \approx 4$$

REF: 010638a

9 ANS:



$$\tan 11 = \frac{400}{\text{adjacent}}$$

$$\text{adjacent} \approx 2058$$

REF: 010235a

10 ANS:

$$45. \quad \tan 66 = \frac{\text{opposite}}{20}$$

$$\text{opposite} \approx 45$$

REF: 080536a

11 ANS:

$$79.4. \quad \tan 52 = \frac{\text{opposite}}{62}$$

$$\text{opposite} \approx 79.4$$

REF: 060639a

12 ANS:

$$114'' \text{ and } 37''. \quad \cos 72 = \frac{\text{adjacent}}{10} \quad \sin 72 = \frac{\text{opposite}}{10}$$

$$\text{adjacent} \approx 3.1 \text{ feet} \approx 37 \text{ inches} \quad \text{opposite} \approx 9.5 \text{ feet} \approx 114 \text{ inches}$$

REF: 080033a

13 ANS:

$$\sin 50 = \frac{\text{opposite}}{200}$$

153. opposite  $\approx 153$

REF: 080133a

14 ANS:

287,457.  $\tan 21.5 = \frac{336.5}{a}$   $\frac{1}{2} \times 673 \times 854.2550169 \approx 287457$   
 $a \approx 854.2550169$

REF: 080829b