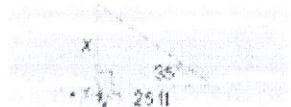


4-1 Right Triangle Trigonometry

27. **MOUNTAIN CLIMBING** A team of climbers must determine the width of a ravine in order to set up equipment to cross it. If the climbers walk 25 feet along the ravine from their crossing point, and sight the crossing point on the far side of the ravine to be at a 35° angle, how wide is the ravine?



28. **SNOWBOARDING** Brad built a snowboarding ramp with a height of 3.5 feet and an 18° incline.
- Draw a diagram to represent the situation.
 - Determine the length of the ramp.
29. **DETOUR** Traffic is detoured from Elwood Ave., left 0.8 mile on Maple St., and then right on Oak St., which intersects Elwood Ave. at a 32° angle.
- Draw a diagram to represent the situation.
 - Determine the length of Elwood Ave. that is detoured.
30. **PARACHUTING** A paratrooper encounters stronger winds than anticipated while parachuting from 1350 feet, causing him to drift at an 8° angle. How far from the drop zone will the paratrooper land?



39. **PARASAILING** Kayla decided to try parasailing. She was strapped into a parachute towed by a boat. An 800-foot line connected her parachute to the boat, which was at a 32° angle of depression below her. How high above the water was Kayla?



40. **OBSERVATION WHEEL** The London Eye is a 135-meter-tall observation wheel. If a passenger at the top of the wheel sights the London Aquarium at a 58° angle of depression, what is the distance between the aquarium and the London Eye?



41. **ROLLER COASTER** On a roller coaster, 375 feet of track ascend at a 55° angle of elevation to the top before the first and highest drop.
- Draw a diagram to represent the situation.
 - Determine the height of the roller coaster.

Right Triangle Trigonometry

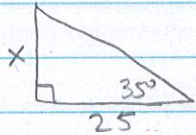
42. **SKI LIFT** A company is installing a new ski lift on a 225-meter-high mountain that will ascend at a 48° angle of elevation.
- Draw a diagram to represent the situation.
 - Determine the length of cable the lift requires to extend from the base to the peak of the mountain.
43. **BASKETBALL** Both Derek and Sam are 5 feet 10 inches tall. Derek looks at a 10-foot basketball goal with an angle of elevation of 29° , and Sam looks at the goal with an angle of elevation of 43° . If Sam is directly in front of Derek, how far apart are the boys standing?



55. **BASEBALL** Michael's seat at a game is 65 feet behind home plate. His line of vision is 10 feet above the field.
- Draw a diagram to represent the situation.
 - What is the angle of depression to home plate?
56. **HIKING** Jessica is standing 2 miles from the center of the base of Pikes Peak, and looking at the summit of the mountain, which is 1.4 miles from the base.
- Draw a diagram to represent the situation.
 - With what angle of elevation is Jessica looking at the summit of the mountain?

Right Triangle Trig. # 27-30, # 39-43, 55, 56

27.

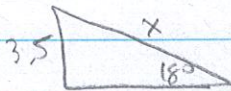


$$\tan 35 = \frac{x}{25}$$

$$25 \tan 35 = x$$

$$x = 17.5 \text{ ft.}$$

28.



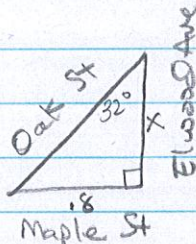
$$\sin 18 = \frac{3.5}{x}$$

$$x \sin 18 = 3.5$$

$$x = \frac{3.5}{\sin 18}$$

$$x = 11.3 \text{ ft.}$$

29.



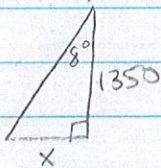
$$\tan 32 = \frac{x}{.8}$$

$$x \tan 32 = .8$$

$$x = \frac{.8}{\tan 32}$$

$$x = 1.3 \text{ miles}$$

30.

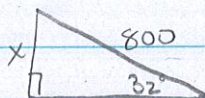


$$\tan 8 = \frac{x}{1350}$$

$$1350 \tan 8 = x$$

$$x = 189.7 \text{ ft.}$$

39.

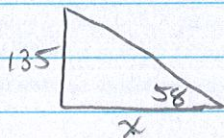


$$\sin 32 = \frac{x}{800}$$

$$800 \sin 32 = x$$

$$x = 423.9 \text{ ft.}$$

40.



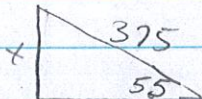
$$\tan 58 = \frac{135}{x}$$

$$x \tan 58 = 135$$

$$x = \frac{135}{\tan 58}$$

$$x = 84.4 \text{ m}$$

41.

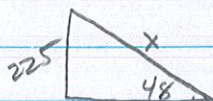


$$\sin 55 = \frac{x}{375}$$

$$375 \sin 55 = x$$

$$x = 307.2 \text{ ft.}$$

42.



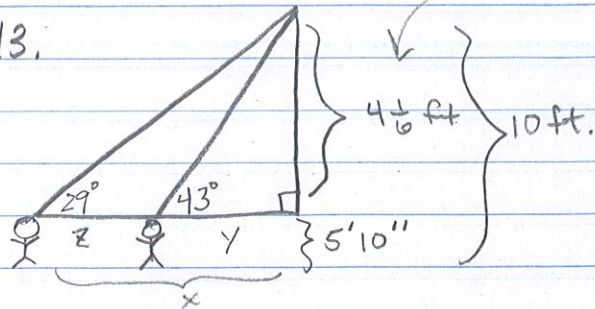
$$\sin 48 = \frac{225}{x}$$

$$x \sin 48 = 225$$

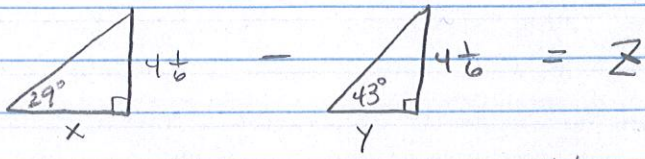
$$x = \frac{225}{\sin 48}$$

$$x = 302.8 \text{ m}$$

43.



$$\begin{aligned}
 &10' - 5' 10'' \\
 &= 10 - 5 \frac{10}{12} \\
 &= \frac{120}{12} - \frac{70}{12} = \frac{50}{12} = 4 \frac{1}{6}
 \end{aligned}$$



$$\tan 29 = \frac{4 \frac{1}{6}}{x} \qquad \tan 43 = \frac{4 \frac{1}{6}}{y}$$

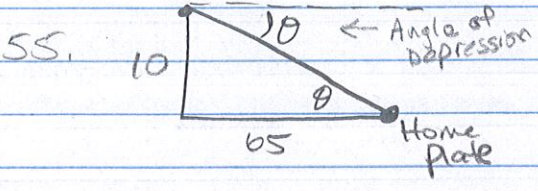
$$x \tan 29 = 4 \frac{1}{6} \qquad y \tan 43 = 4 \frac{1}{6}$$

$$x = \frac{4 \frac{1}{6}}{\tan 29} \qquad y = \frac{4 \frac{1}{6}}{\tan 43}$$

$$x = 7.5 \text{ ft.} \qquad y = 4.5 \text{ ft.}$$

$$7.5 - 4.5 = x$$

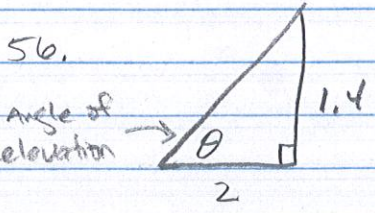
$$\boxed{3 \text{ feet} = x}$$



$$\tan \theta = \frac{10}{65}$$

$$\theta = \tan^{-1} \frac{10}{65}$$

$$\boxed{\theta = 8.7^\circ}$$



$$\tan \theta = \frac{1.4}{2}$$

$$\theta = \tan^{-1} \frac{1.4}{2}$$

$$\boxed{\theta = 35^\circ}$$