

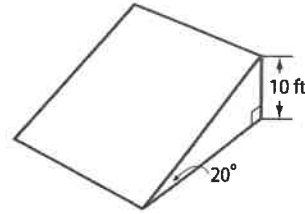
Check Your Understanding

Step-by-Step Solutions begin on page R14.



Example 1

1. **BIKING** Lenora wants to build the bike ramp shown. Find the length of the base of the ramp.

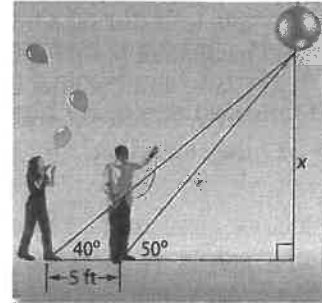


Example 2

2. **BASEBALL** A fan is seated in the upper deck of a stadium 200 feet away from home plate. If the angle of depression to the field is 62° , at what height is the fan sitting?

Example 3

3. **MODELING** Annabelle and Rich are setting up decorations for their school dance. Rich is standing 5 feet directly in front of Annabelle under a disco ball. If the angle of elevation from Annabelle to the ball is 40° and Rich to the ball is 50° , how high is the disco ball?

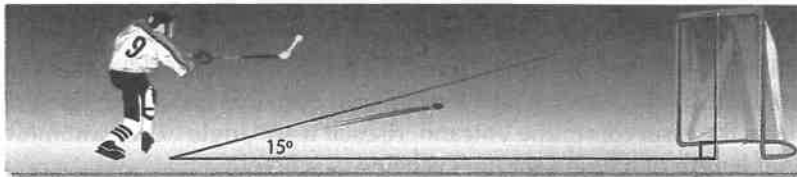


Practice and Problem Solving

Extra Practice is on page R8.

Example 1

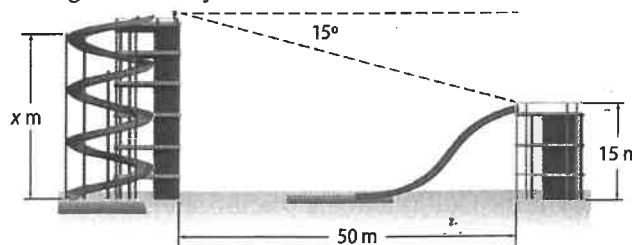
4. **HOCKEY** A hockey player takes a shot 20 feet away from a 5-foot goal. If the puck travels at a 15° angle of elevation toward the center of the goal, will the player score?



5. **MOUNTAINS** Find the angle of elevation to the peak of a mountain for an observer who is 155 meters from the mountain if the observer's eye is 1.5 meters above the ground and the mountain is 350 meters tall.

Example 2

6. **WATERPARK** Two water slides are 50 meters apart on level ground. From the top of the taller slide, you can see the top of the shorter slide at an angle of depression of 15° . If you know that the top of the other slide is approximately 15 meters above the ground, about how far above the ground are you? Round to the nearest tenth of a meter.



7. **AVIATION** Due to a storm, a pilot flying at an altitude of 528 feet has to land. If he has a horizontal distance of 2000 feet to land, at what angle of depression should he land?

Example 3

8. **PYRAMIDS** Miko and Tyler are visiting the Great Pyramid in Egypt. From where Miko is standing, the angle of elevation to the top of the pyramid is 48.6° . From Tyler's position, the angle of elevation is 50° . If they are standing 20 feet apart, and they are each 5 feet 6 inches tall, how tall is the pyramid?

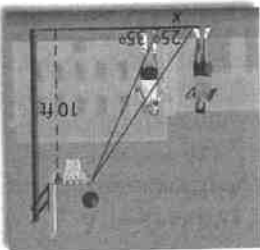




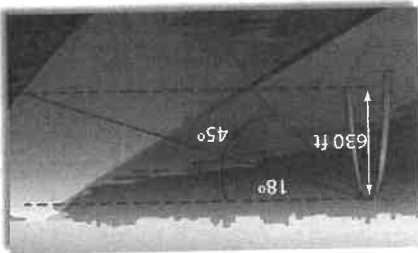
9 DIVING Austin is standing on the high dive at the local pool. Two of his friends are in the water as shown. If the angle of depression to one of his friends is 40° , and 30° to his other friend who is 5 feet beyond the first, how tall is the platform?



10. BASKETBALL Claire and Marisa are both waiting to get a rebound during a basketball game. If the height of the basketball hoop is 10 feet, the angle of elevation between Claire and the goal is 35° , and the angle of elevation between Marisa and the goal is 25° , how far apart are they standing?

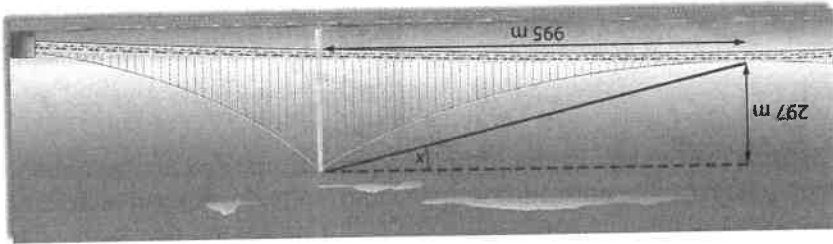


11. RIVERS Hugo is standing in the top of St. Louis' Gateway Arch, looking down on the Mississippi River. The angle of depression to the closer bank is 45° and the angle of depression to the farther bank is 18° . The arch is 630 feet tall. Estimate the width of the river at that point.

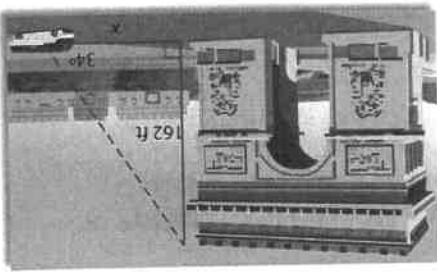


12. MODELING The Unzen Volcano in Japan has a magma reservoir located 15 kilometers beneath the Chijiwa Bay, located east of the volcano. A magma channel, which connects the reservoir to the volcano, rises at a 40° angle of elevation toward the volcano. What length of magma channel is below sea level?

13. BRIDGES Suppose you are standing in the middle of the platform of the world's longest suspension bridge, the Akashi Kaikyo Bridge. If the height from the top of the platform holding the suspension cables is 297 meters, and the length from the platform to the center of the bridge is 995 meters, what is the angle of depression from the center of the bridge to the platform?



14. LIGHTHOUSES Little Gull Island Lighthouse shines a light from a height of 91 feet with a 6° angle of depression. Plum Island Lighthouse, 1800 feet away, shines a light from a height of 34 feet with a 2° angle of depression. Which light will reach a boat that sits exactly between Little Gull Island Lighthouse and Plum Island Lighthouse?



15. TOURISM From the position of the bus on the street, the Arc de Triomphe is at an angle of 34° . If the arc is 162 feet tall, how far away is the bus? Round to the nearest tenth.