

UNIT 2 • RIGHT TRIANGLE TRIGONOMETRY**Lesson 2: Applying Trigonometric Ratios****Practice 2.2.3: Problem Solving with the Pythagorean Theorem and Trigonometry**

Unless otherwise specified, round all final distances and angle measures to the nearest whole number.

1. A 6-foot-tall man is standing 50 feet from a flagpole. When he looks at the top of the flagpole, the angle of elevation is 39° . Find the height of the flagpole to the nearest foot.
2. A boy flies a kite with a 100-foot-long string. The angle of elevation of the string is 48° . How high is the kite from the ground?
3. A 14-foot ladder is being used to get the top of a 12-foot-tall wall. At what angle of elevation must the ladder be positioned in order to reach the top of the wall?
4. A mother gazes out a second-floor window at her son playing at the playground. If the mother's eye level is 12.6 meters off of level ground and the playground is 20 meters from the base of the building, what is the angle of depression from the mother's line of sight to the playground?
5. A little girl is watching planes take off of the runway from a building's rooftop 40 meters away from the airport. If the height of the building is 400 meters and the girl snaps a photo of a plane at a 24° angle of elevation, what is the altitude, or vertical height, of the plane when the photo is taken?

continued

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6. From a hot air balloon 2,500 feet above the ground, you see a clearing whose angle of depression is 25° . To the nearest foot, find your horizontal distance from the clearing.

7. A slide at a water park with a constant slope sends riders traveling a distance of 45 feet to the pool at the bottom of the slide. If the depth of the pool is 12 feet and the angle of depression from the top of the slide is 45° , what is the vertical distance from the top of the slide to the bottom of the pool?

8. Tourists marvel at Niagara Falls from two sightseeing boats, *A* and *B*. The boats are 100 feet and 150 feet away from the base of the falls, respectively. Given that Niagara Falls is 167 feet high, what is the angle of elevation from both boats to the top of the falls?

9. A commuter plane is flying at an altitude of 1,000 meters. A passenger takes a picture of the top of a tree and estimates that the angle of depression to the top of the tree is about 15° . He estimates the angle of depression to the base of the tree to be 25° . What is the height of the tree?

10. Burj Khalifa in Dubai is the tallest building in the world, standing at 828 meters. An adjacent building, 100 meters away, stands at 550 meters tall. What is the angle of depression from Burj Khalifa to the adjacent building?