

Directions: All answers must be in simplest radical form.

1. A baseball diamond is a square with sides of 90 feet. What is the distance between first base and third base?
2. A suitcase measures 24 inches long and 18 inches high. What is the diagonal length of the suitcase?
3. In a computer catalog, a computer monitor is listed as being 19 inches. This distance is the diagonal distance across the screen. If the screen measures 10 inches in height, what is the actual width of the screen?
4. Two joggers run 8 miles north and then 12 miles west. What is the shortest distance they must travel to return to their starting point?
5. Oscar's dog house is shaped like a tent. The slanted sides are both 7 feet long and the bottom of the house is 6 feet across. What is the height of his dog house, in feet, at its tallest point?
6. Scott wants to swim across a river that is 40 meters wide. He begins swimming perpendicular to the shore he started from but ends up on the other side, 10 meters down river from the point directly across from where he started, because of the current. How far did he actually swim from his starting point?

7. You are on a camping trip. One day you walk 2 mi east and 4 mi north of your campsite to a lake. Another day, you walk 1 mi west and 2 mi south of your campsite to a waterfall. Find the distance from your campsite to the lake and the distance from your campsite to the waterfall?

8. If the length of the hypotenuse is $9\sqrt{3}$ cm and one leg measures $8\sqrt{2}$ cm, find the length of the other leg.

9. A rope 17 m long is attached to the top of a flagpole. The rope is able to reach a point on the ground 8 m from the base of the pole. Find the height of the flagpole.

10. At Martian high noon, Dr. Rhonda Bend leaves the Martian U.S. Research Station traveled 60km due east. Professor I.M. Bryte takes off from the station heading and he traveled 50 km due north straight for the polar ice cap. How far apart are the doctor and the professor?

11. A flagpole has cracked 9 feet from the ground and fallen as if hinged. The top of the flagpole hit the ground 12 feet from the base. How tall was the flagpole before it fell?

12. Ellen is standing on a dock 6 m above the water. She is pulling in a boat that is attached to the end of a 12 m rope. How far is the boat initially away from her?