1. A dog runs 5 m to the right then comes back 2 m to the left.

   a. Draw a vector diagram of the dog’s movement.

   b. Use the tip-to-tail method to determine how far the dog moves from its initial position.

   c. Find the resultant displacement mathematically.

2. A passenger rides the subway 7 km north, 5 km south, then 2 km north.

   a. Draw a vector diagram of the passenger’s movement on the subway.

   b. Use the tip-to-tail method to determine how far the passenger travels from her initial position.

   c. Find the resultant displacement mathematically.
3. A rocket launched from an initial height of 1.2 m reaches a height of 14 m then falls to the ground.

   a. Draw a vector diagram of the rocket’s movement.

   b. How far away vertically does the rocket land from its initial position?

   c. Find the resultant displacement mathematically.

4. While completing an obstacle course, a runner moves 30 m north, 20 m south, then another 5 m north. At the end of the course, how far away is the runner from his starting point?
Work each of the following problems. SHOW ALL WORK.

5. Two children chase each other through a playground, running 10 m north, 6 m east, then 2 m south. At the end of the game, how far are the children from where they started? Use a component table to solve.

6. The local high school is installing new bleachers at the stadium and must also add handrails to meet code. The students know the bleachers are 8 m tall, and they measure the depth of the bleachers at 7 m. How long must the handrails be to go along the bleachers from bottom to top? Use a component table to solve.
7. How far away from her initial position is a cyclist who travels 18 km east, 12 km south, and 9 km west during her ride? Use a component table to solve.

8. While performing the halftime show on Friday night, a marcher completes a path that is 15 yd east, 5 yd south, and 10 yd north. How far is the marcher from his initial position? Use a component table to solve.