Unit 1F
Mathematical Resolution of Vectors
Practice Problems

Name:

Date:

Work each of the following problems. SHOW ALL WORK.

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.

PHYSICS IN MOTION
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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.

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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?

   _____

PHYSICS IN MOTION
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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.

PHYSICS INMOTION ⟫⟫⟫
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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.