

## Distance and Displacement Lab Activity Solutions

2 problems worth 7.5 points each = 15 points total



- **Question 1:** What is the total round-trip distance traveled by my mom when she drives 224 kilometers from her home in Little Rock to Harrison and back along the same route to her home in Little Rock? *Make sure you use the proper SI unit for distance and any direction if necessary.* Place the number in the first blank, the unit in the second blank, and the direction in the third blank below.

**Answer:** The **distance** my mom traveled is just the **length of her path** between Little Rock and Harrison and back again. The distance from Little Rock to Harrison is 224 kilometers, and the distance back is the same: 224 kilometers. So, the distance she traveled is **224 kilometers + 224 kilometers = 448 kilometers**. We are asked to express this using the proper SI unit for distance. The SI unit for distance is the **meter**. To convert from kilometers to meters, we just need to **multiply by 1,000**. So, 448 kilometers  $\times$  1000 = 448,000 meters. **The distance my mother traveled from Little Rock to Harrison and back again is 448,000 meters. Because distance is a scalar quantity, we do not need to include a direction.**

| Point Assignment for Question 1              |                             |
|----------------------------------------------|-----------------------------|
| Calculation was performed correctly.         | 5 points/3 points for close |
| The unit conversion was performed correctly. | 2 points/1 point for close  |
| No direction was included.                   | .5 points                   |

- **Question 2:** What is the total round-trip displacement traveled by my mom when she drives 224 kilometers from her home in Little Rock to Harrison and back along the same route to her home in Little Rock? *Make sure you use the proper SI unit*

*for displacement and any direction if necessary.* Place the number in the first blank, the unit in the second blank, and the direction in the third blank below.

**Answer:** My mother's **displacement** is defined as **her final position - her initial position**. **Because she begins and ends her journey in the same position, her home in Little Rock, her total displacement over the trip is just ZERO.** Even though **displacement is a vector quantity, we do not need to include a direction because any time a vector quantity is equal to ZERO, it has NO direction.**

| Point Assignment for Question 2      |                                                                                                                                   |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Calculation was performed correctly. | 7 points/4 points for close<br><b>Note: I'm not taking off for improper units here because 0 meters = 0 kilometers = 0 miles.</b> |
| No direction was included.           | .5 points                                                                                                                         |