Week 2: Position and Distance   Name _____

This week we used the Pythagorean Theorem to help determine distances between points which were located on a rectangular coordinate system (where the axes cross at right angles). Here are some sample math and physics problems you should use to make sure both that you understand the concepts and that you can do the calculations. (The answers are on the back so that you can check yourself.)

1   Just numbers...

1. Find the distance from the origin to each of the following points:

    (a) (39 m, -133 m)
    (b) (-59 m, -22 m)
    (c) (45 m, 17 m)

2. Find the distance between each of the points listed above

    (a) Distance between (a) and (b)
    (b) Distance between (b) and (c)
    (c) Distance between (a) and (c)

3. List two points which are 7 cm from the origin and have a y-coordinate of 3.5 cm.

Bonus: List two points which are a distance of 5 cm away from the point (6 cm, 2 cm) and have a y-ccordinate of 5 cm.

2   In story form...

Two sets of scientists measure the positions of objects in a room. They both use the same scale and origin, but the axes of their coordinate systems are not the same. The table below shows some of the data the two groups collected. Can you fill in the missing data? *Hint: What do you know about the distance from the origin as measured by the two groups?*

	Lab A		Distance from origin	Lab B	
	x	y		x	y
Edge of chalkboard	0 cm	108 cm	_____	-35 cm	_____
Corner of Allen's desk	124 cm	131 cm	_____	_____	165 cm

What distance would the scientists from Lab A measure between the corner of Allen's desk and the edge of the chalkboard?

What distance would the scientists from Lab B measure between the corner of Allen's desk and the edge of the chalkboard?

3 Answers

3.1 Just numbers...

1. Find the distance from the origin to each of the following points:

   (a) **139 m**
   (b) **63 m**
   (c) **48 m**

2. Find the distance between each of the points listed above

   (a) Distance between (a) and (b) = **148 m**
   (b) Distance between (b) and (c) = **111 m**
   (c) Distance between (a) and (c) = **150 m**

3. **(6.1 cm, 3.5 cm) and (-6.1 cm, 3.5 cm)**

Bonus: List two points which are a distance of 5 cm away from the point (6 cm, 2 cm) and have a y-ccordinate of 5 cm. **(10 cm, 5 cm) and (2 cm, 5 cm)**

3.2 In story form...

Two sets of scientists measure the positions of objects in a room. They both use the same scale and origin, but the axes of their coordinate systems are not the same. The table below shows some of the data the two groups collected. Can you fill in the missing data? *Hint: What do you know about the distance from the origin as measured by the two groups?* **It's the same!**

	Lab A		Distance from origin	Lab B	
	x	y		x	y
Edge of chalkboard	0 cm	108 cm	**108 cm**	-35 cm	**102 cm**
Corner of Allen's desk	124 cm	131 cm	**180 cm**	**73 cm**	165 cm

What distance would the scientists from Lab A measure between the corner of Allen's desk and the edge of the chalkboard? **126 cm**

What distance would the scientists from Lab B measure between the corner of Allen's desk and the edge of the chalkboard? **125 cm**