Using Vectors

1. Plot the five positions on the same axis. Label a compass on the axis. Use +y as the same as North and +x as East.

Position 1: (0, 0) m
Position 2: (3, 2) m
Position 3: (2, -2) m
Position 4: (-3, -5) m
Position 5: (-4, -1) m

2. Describe the displacements between consecutive positions. Separate the East-West motion from the North-South motion. ($\mathbf{S_{12}}$ represents the displacement from position 1 to position 2)

	E-W	**N-S**
$\mathbf{S_{12}}$ =	_____	_____
$\mathbf{S_{23}}$ =	_____	_____
$\mathbf{S_{34}}$ =	_____	_____
$\mathbf{S_{45}}$ =	_____	_____

3. Describe how to find the distance of the displacements.

4. Show the calculations to find distance for the displacements.

5. Describe how to find the direction of the displacements. (Which trigonometric function would you use?)

6. Show the calculations to find the direction for the displacements.

7. Write each of the displacements as vectors with a distance and a direction.

	Distance		**Direction**
$\mathbf{S_{12}}$ =	_____	@	_____
$\mathbf{S_{23}}$ =	_____	@	_____
$\mathbf{S_{34}}$ =	_____	@	_____
$\mathbf{S_{45}}$ =	_____	@	_____

8. Sketch the following displacement vectors.

R_1 = 10 m @ 30° North of East
R_2 = 15 m @ 25° South of East
R_3 = 20 m @ 30° West of North

9. Describe how to find the components for the displacement vector. (Which trigonometric functions would you use?)

10. Show the calculation to find the components of the vector **R**.

11. Write each vector as the combination of two components.

	E-W	**N-S**
R_1 =	_____	_____
R_2 =	_____	_____
R_3 =	_____	_____