

# Vector Magnitude and Direction

Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

*Answer the following questions and show all work. Include the magnitude, angle, and word description of the direction in all of your answers. Because many of these problems involve more than two vectors a drawing is very important.*

1. Susan, who lived in the city, was walking home from the store. She walked north 45.0 meters and then 34.5 meters east. She then turned north again and walked 24.5 meters. What was Susan's total displacement?
2. A sail boat what an inept captain had to be towed into shore. The tow boat was pulling the boat at a velocity of 15.8 m/s south. However, there was also a current pushing both boats north at a velocity of 7.9 m/s. It also happened to be a windy day (amazing isn't it how convenient it is) and so the boat was being pushed to the west with a velocity of 5.7 m/s. What was the resultant velocity of the sailboat?
3. Peter was the starting running back for the football team and he was making an incredible run. He was traveling east at a velocity of 5.23 m/s when a player from the other team hit him traveling south at 4.78 m/s. What was the velocity of the two players if they continued with their respective velocities?
4. While Santa was delivering presents to the children of Nashville, Tennessee he experienced a strong wind perpendicular to his motion. If Santa was flying west at 78.0 m/s and the wind was blowing 20.3 m/s south, what was the actual velocity of the sled?
5. At what angle should Santa fly to ensure that he actually travels west?
6. Gregory was walking through the halls of the school when he realized that he was walking in perpendicular directions and he could easily calculate his displacement using the incredibly useful techniques he learned in physics. He recognized that he walked 12.5 meters left and then 18.9 meters down. How far must he walk to the right so that his resultant displacement is 20.1 m?