2D Vector Practice

Directions:

- draw a vector diagram for each problem before solving with math.
- be sure that each answer has units
- 1. Sally walks 3 meters up and 4 meters left.
 - A. Draw a picture of Sally's distance traveled
 - B. In a separate color (or draw a thick line), draw Sally's displacement vector.
 - C. Calculate the magnitude of Sally's displacement
- A plane is flying 30 m/s south, and is being pushed east by a crosswind of 13 m/s.
 A. Calculate the resultant velocity of the plane.
 - B. In words, which direction is the plane traveling (north, south, east, west, or a combination)?
- 3. While riding in the back of a pickup truck traveling 8 m/s west, you jump out the north side traveling 2 m/s. What is your resultant velocity do you hit the ground?
- 4. While floating down a river at 2 m/s, you start to paddle perpendicularly towards the shore with a speed of 3 m/s. What is your resultant speed?

In the walking lab, you had multi-step instructions. Treat this problem the same way, but use only your brain/calculator to figure out the answer (don't actually walk around):

- 1. Walk 4 steps forward, 4 steps backward, then 2 steps left.
 - A. Draw the vector path.
 - B. What is your distance traveled?
 - C. What is your displacement?

- Walk 14 steps left, 8 steps right, and 8 steps backward.
 A. Draw the vector path.
 - B. What is your distance traveled?
 - C. What is your displacement?
- Walk 3 steps backward, 4 steps right, and 6 steps forward.
 A. Draw the vector path.
 - B. What is your distance traveled?
 - C. What is your displacement?

Balanced / Unbalanced Forces Review

- 1. You are being pushed by two forces: one force pushes you forward with a force of 6 units. Another force pushes you backwards with a force of 8 units.
 - 1. What is your net force?
 - 2. Are these forces balanced or unbalanced?
 - 3. Will your motion be constant or accelerating?
- 2. A damsel in distress has fallen off a cliff, but two friends each have a hold on her hand and are trying to pull her up. The girl is being pulled down with 100N of gravitational force. Her two friends are each pulling with a force of 50N.
 - 1. What is their net force?
 - 2. Are these forces balanced or unbalanced?

3. Will the girl's motion be constant or accelerating?