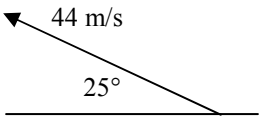
A-Day: Due Thurs., Oct 7 (Assigned: 10/9)
B-Day: Due Fri., Oct 8 (Assigned: 10/10)

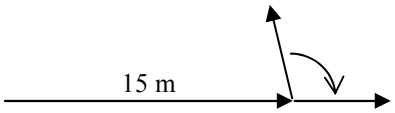
2008 Two Dimensions 7

1. What do we call the path of any projectile? A p_____.



2. Use the vector at the right to answer the following questions.
   A. What direction should you use to resolve it into its components?
   B. After you have resolved it into components, what units will the have?

3. Notice the two vectors at the right. Keep the 15 m long vector alone at 0° (pointing to the right). Think about all of the ways you could turn the 5 m long vector when you add them together.
   A. What is the largest the resultant could possibly be?
   B. What is the shortest the resultant could possibly be?



4. Use the notes "Vector Basics" and "Adding Vectors.
   A. What do we mean by the magnitude of a vector?

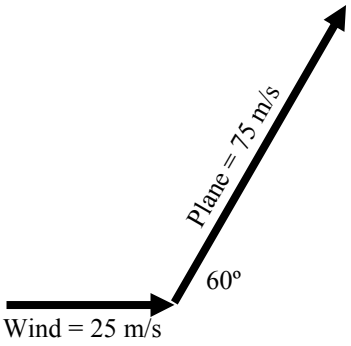
   B. What is resolving a vector?

5. Think of all of the possible directions for a vector. At what direction would the vector's x and y components be equal?

Use the "Relative Motion" notes to answer the following.

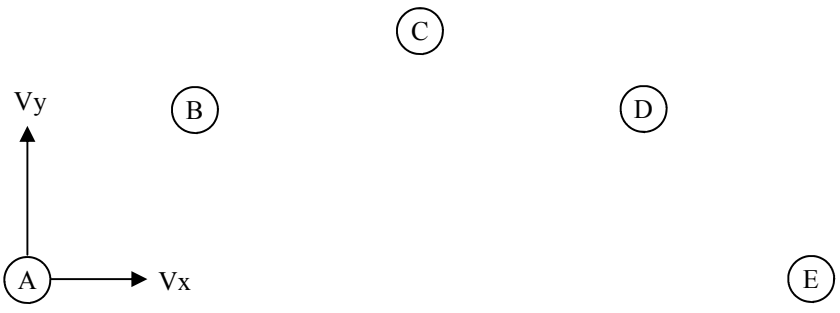
6. Imagine you are sitting on a bus. If the bus starts to move forward and you look out the window. The light pole on the sidewalk appears to be moving what direction to you?

7. While the bus is moving 10 m/s forward, you walk 0.5 m/s up to talk to the bus driver. Relative to a person standing on the sidewalk, how fast do you seem to be moving?



8. A plane is flying 75 m/s at a direction of 60°. It is pushed by a 25 m/ s wind that is blowing directly east. Realizing that this is just adding vectors, again. Find the plane's speed and direction in the wind.

9. The arrows show the magnitude (amount) of Vx and Vy at point A on the projectile's parabola.
   A. What is a_x for the projectile?
   B. As the projectile goes from A to C, does Vy increase or decrease?
   C. Use arrows to show Vx and Vy at each letter. Arrows don't have to be the exact right size, just bigger or smaller.



10. A projectile is launched from the ground to the ground at an angle of 30 m/s and an angle of 65°. Find range.

11. A projectile is fired from a launcher horizontally going 12 m/s from 4 m above the ground.
    A. What is Δy for the projectile?
    B. Since it is fired horizontally, what is Vyi?
    C. What two points on the freefall parabola is this?
    D. Using what you know (above) solve for the time it takes to hit the ground.

    E. What is Vx?
    F. Find the range of the projectile.

From the Bellwork.

12. Barnacles (a kind of shellfish) live on whales. Since the barnacle is a filter feeder (eats from the water that passes through it), living on the whale gives it greater food access since the whale moves, allowing more water to pass through it. The whale is neither helped nor harmed by the barnacles. What kind of symbiosis is this?

13. In Costa Rica, the cycropsia tree has ants living inside of it. The ants feed on the sap of the tree. If a bird or other animal lands on the tree, the ants immediately swarm out of the tree, attacking the invader, thus protecting the tree. What kind of symbiosis is this?

14. Us eating cows (steak, hamburger…) is what kind of symbiosis?

15. In Central America some types of vampire bats land on large mammals (livestock) and lick blood out of wounds on their necks. The live stock don't die. What kind of symbiosis is this?