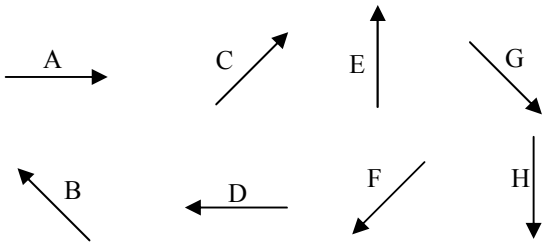
A-Day: Due Mon., Oct 19
B-Day: Due Tues., Oct 20

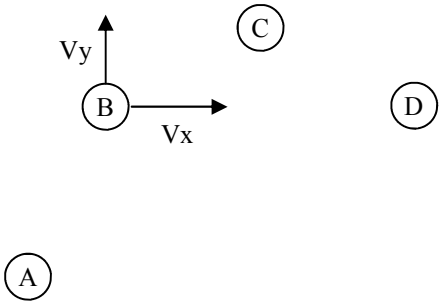
2009 Two Dimensions 7

Make sure you look at the past homeworks. This homework will not cover the entire test: there's not enough time. I must assumes that you have done the other homeworks, too.

1. +, −, or 0?
   A. ____Vector A's x-component?
   B. ____Vector E's x-component?
   C. ____Vector B's x-component?
   D. ____Vector F's y-component?

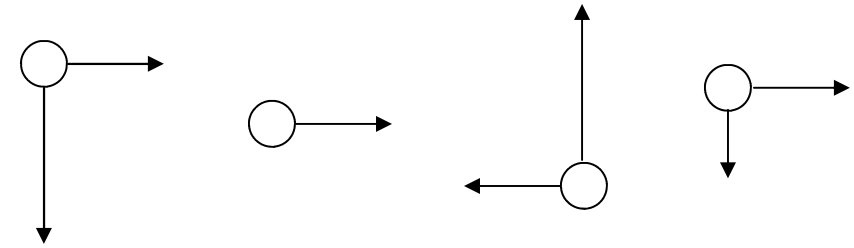


2. Draw the resultant for D + 2G −E + H:



From the "Projectile Motion" notes:

3. The x and y velocities of position B are given at the left. Below are the four other positions from the diagram. Put the correct letters in the circles below.

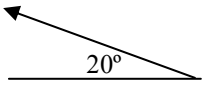


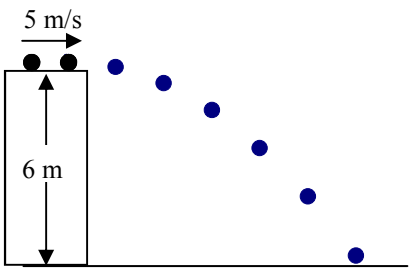
4. If an ball rolls off of a 2 m tall table going 4 m/s,
   A. What is its Δy?
   B. What is a_y?
   C. What is a_x?
   D. What is V_{xi}?
   E. What is V_{yi}?

   F. What is the x-direction acceleration for any projectile?
   G. If the initial Vx = 15 m/s, what is the final Vx?

5. What kind of symbiosis: Mutualism; Commensalism; Predation; Parasitism?
   A. A fox lives in a hole made by the roots of a tree. The tree is neither helped nor harmed.
   B. A leech latches onto a human and drinks the human's blood.
   C. In human stomachs, bacteria eat the plants we eat, helping us digest the plant matter.
   D. When a human eats a steak.

6. What direction do we use for this angle?

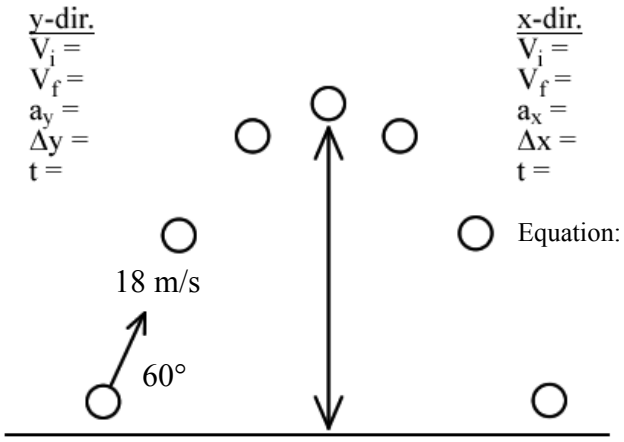




7. A ball is shot 5 m/s off of a 6 m tall table.
   A. Write the x and y variables for the ball.

   B. Calculate its hang time (time).

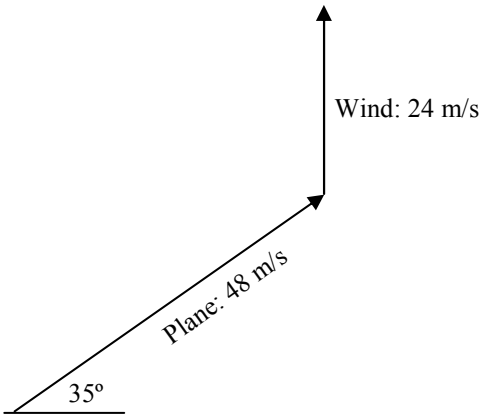
   C. Calculate its range (how far away it lands).



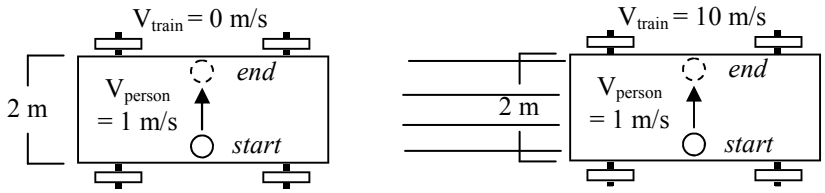
I'm going to assume you know how to do a "ground to ground" problem.

8. A rock is thrown 18 m/s into the air at 60º.
   How high does the projectile go?
   (*Assign variables, etc*)

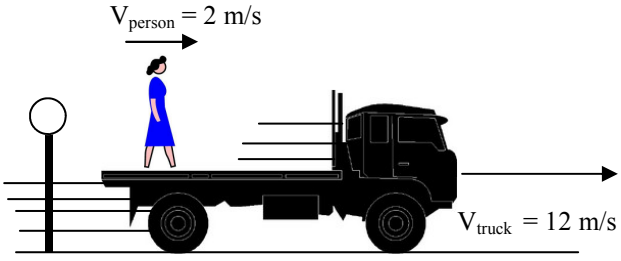
9. A person walks 6 m east, 4 m south, 2 m west, and 10 m north. Calculate the person's total displacement (magnitude and direction).



10. A bi-plane is flying 48 m/s at a direction of 35º.
    The wind is blowing 24 m/s directly north.
    A. What is the direction (in degrees) of the wind?
    B. How much of the wind is blowing horizontal?
    C. From the pointed end of the plane's arrow, draw a line straight down.
    D. From the non-pointed side of the plane's arrow, draw a horizontal line to the right.
    E. Calculate the x and y components of the plane's velocity.
    F. Draw the resultant for the two vectors.
    G. Add the two vectors to find the total velocity of the plane.



11. A person can walk across a train in 2 seconds when the train is at rest. How long does it take the person to walk across the train when it is moving?



12. A crazy zombie woman is walking on a truck, as shown.
    A. What is her speed relative to the truck?
    B. What is her speed relative to the ground?
    C. If she turns around, what would be her speed relative to the ground?