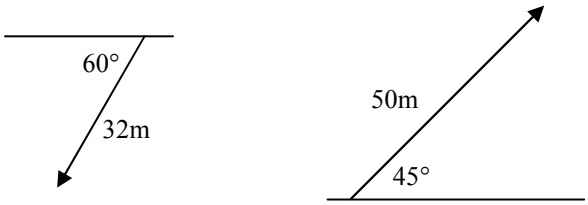
A-Day: Due Wed., Oct 10 (Assigned: 10/5)
B-Day: Due Thurs., Oct 11 (Assigned: 10/9)

Two Dimensions 5

I suggest you try to do these problems without notes, first. Challenge yourself! Then, if you have trouble, follow the notes. The notes tell you exactly how to do this!!!!

If you are still having trouble with understanding how to take angles from the + x axis, look at the back of this homework for help.

1. Add these vectors:



2. A hockey puck slides 3 m/s on the ice rink for 4 seconds. Find the vertical component of the hockey puck's velocity.

3. A car drives at 60^{o}. The car is going 60 mph for 1.2 hours. Find how far it went in the x-direction.

4. A boat is moving 8 m/s at –30°. If there is a current moving 3 m/s at 10°. Find the direction and speed of the boat in the current. (*Add the vectors: find the resultant.)*

5. Person A walks 55 m at 38°. Then the person turns and walks 20 m north. What direction and distance does Person B have to walk to walk straight to Person A final position?

More on back

Use the "Projectile Motion" notes to answer the following questions. (Please READ the notes!!!!!)

6. The speed a projectile is launched is called its: _____ _____

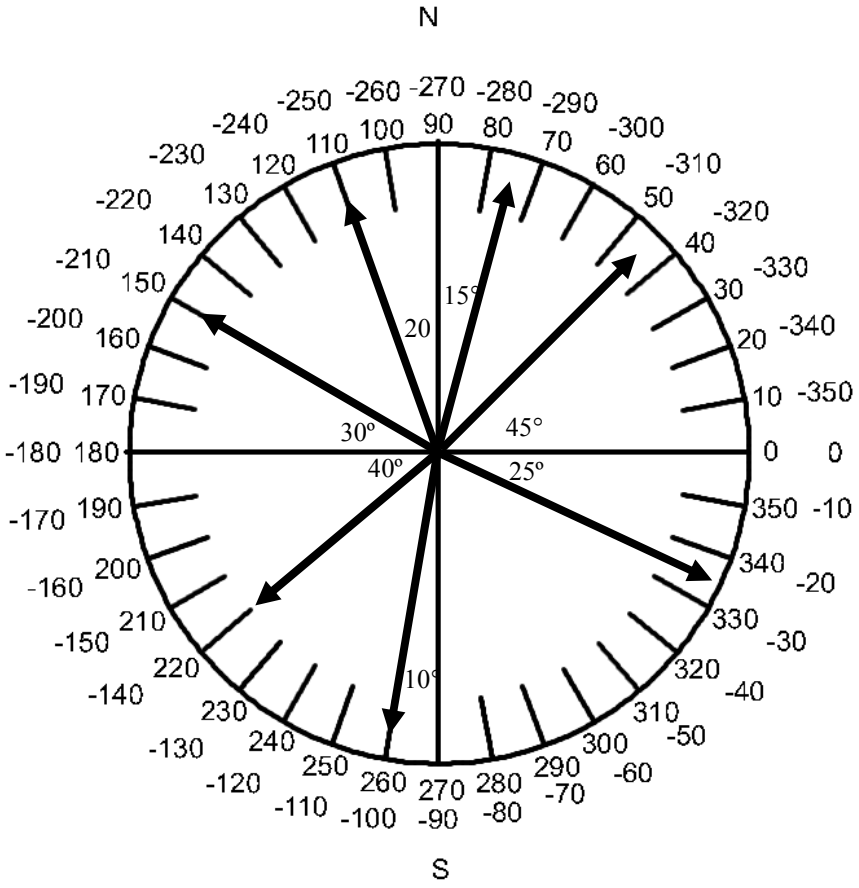
7. If a projectile is launched 60 m/s at 42°, find the projectile's initial x and y velocities.

8. What is the projectile's acceleration in the x-direction?
9. What is the projectile's acceleration in the y-direction?

10. If object 1 is dropped from 4m and object 2 is thrown horizontally from 4m, which one hits the ground first?

11. X or Y?
    A) _____ In which direction is a projectile in freefall?
    B) _____ In which direction is the object at constant speed?
    C) _____ Which direction stops the projectile's motion?
    D) _____ From which direction do you calculate time?

12. How far the projectile moves in the x direction is known as the projectile's _____.



We take all angles from the positive x-axis so that our two component formulas ($V_x = V\cos\theta$; $V_y = V\sin\theta$) will work for ALL vectors. Otherwise you would have to think about how to calculate each vector's components (which leads to mistakes).

On the compass, notice that degrees increase positively when moving counter-clockwise (CCW) and increase negatively when moving clockwise (CW). Notice that 310° and –50° are the same angle. It doesn't matter whether you use positive or negative angles as long as your reference point is the positive x-axis.

Look at the angles on the compass and figure out how to duplicate the following.

Instead of 20º: use 90+20 = 110º
Instead of 25º: use –25º
Instead of 30º: use 180 – 30 = 150º
Instead of 40º: use 180 + 40 = 220º
Instead of 10º: use –100 or 260º
Instead of 15º: use 90 – 15 or 75º
45º is fine, as is.