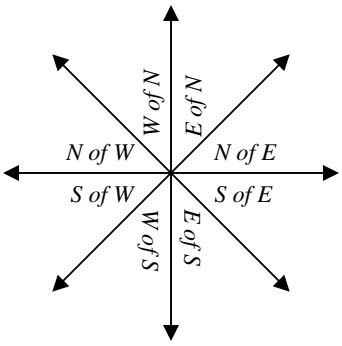
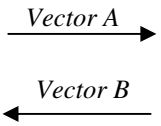
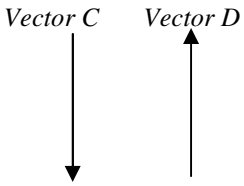
A-Day: due Tues., 10/10 (Assigned 10/5)
B-Day: due Wed., 10/11 (Assigned 10/6)

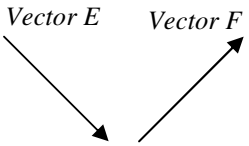
Two Dimensional Motion 9



1. Using the vectors at the side do this graphical vector addition: B + 2C—E.







2. A person walks 4 m west, then 10 m north, then 8 m south, then 9 meters east. Find how where they are from where they started (magnitude and direction).

3. A person walks 45 m at 30 degrees N of E.
   A) How far north did they walk?
   B) How far east did they walk?

4. A plane is flying 32° N of W at 120 m/s. It encounters a wind going 25 m/s at 50° S of W. Find the _____ of these two vectors.

5. A military ship fires on an enemy ship 610 m away. The projectile shell is launched at an angle of 65° and 250 m/s. Will the enemy ship be hit? Give proof one way or the other.

6. How high will the projectile in Q5 actually go?

7. A rocket fired at 38 m/s at 45° has engines that give 12 m/s^2 of acceleration. The rocket can only fire for 18 seconds.
   A. To what altitude can the rocket reach before the engines cut out?

   B. How fast is the rocket going when the engines cut out?

8. Projectile Motion questions:
   A) At the top of its path, what is a projectile's velocity in the y-direction?
   B) At the top of its path, what is a projectile's acceleration in the x-direction?
   C) If a projectile is launched from the ground and lands on the ground, how does its initial and final velocities compare?
   D) A projectile is launched from the top of a 12 m building, what is Δy?
   E) You want to know how high a projectile goes. Vyf = _____?
   F) How do you find Vx for a projectile?
   G) If you know the total time from ground to ground is 18 seconds, how long did it take to get to its highest point?