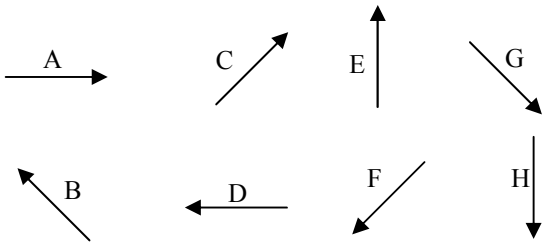
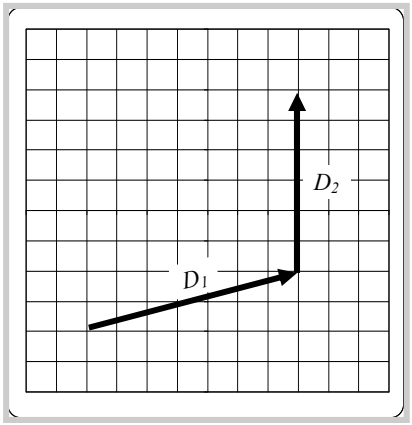
A-Day: Due Thur., Oct 8
B-Day: Due Fri., Oct 9

2009 Two Dimensions 4



Start

1. Crazy walks 2A, E, -G, then 2F. Draw Crazy's path above. Then draw Lazy's path (from the start to where Crazy ends up) and label it R. This is known as graphically adding vectors. Crazy's path is adding them together. Lazy's path is the resultant (total result) of Crazy's path. So, if you are asked to "Graphically add vectors" then draw Crazy's path with the arrows, then draw the Resultant, which is Lazy's path.



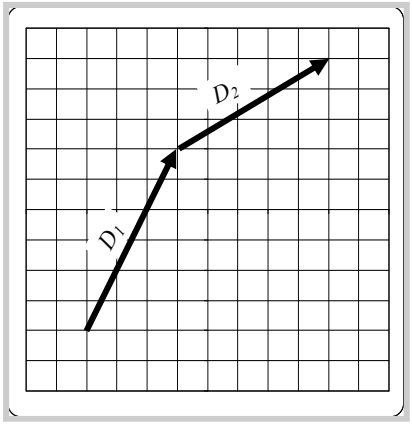
2. Crazy walks the path shown at the left.
   A. Draw Lazy's path and label it R for the r_____.
   B. Draw the x and y components of D_1 using dotted lines.
   C. Below give the x and y components for each of the two vectors:

      X_1 = _____ Y_1 = _____

      X_2 = _____ Y_2 = _____

      X_{total} = _____ Y_{total} = _____

   D. Using the totals, calculate the resultant's magnitude (how far) and direction (at what angle).



3. A. Using dotted line arrows, draw the x and y components for each of the displacements shown (the two vectors: D1 and D2).
   B. Give the x and y components for each of the two vectors.

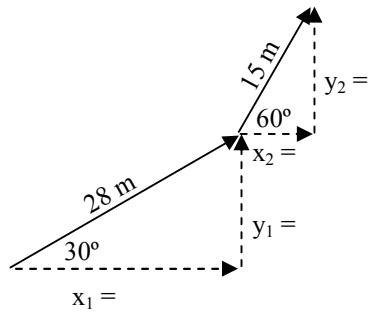
      X_1 = _____ Y_1 = _____

      X_2 = _____ Y_2 = _____

      X_{total} = _____ Y_{total} = _____

   D. Using the totals, calculate the resultant's magnitude and direction.

Now, do the same thing, but use sine and cosine.



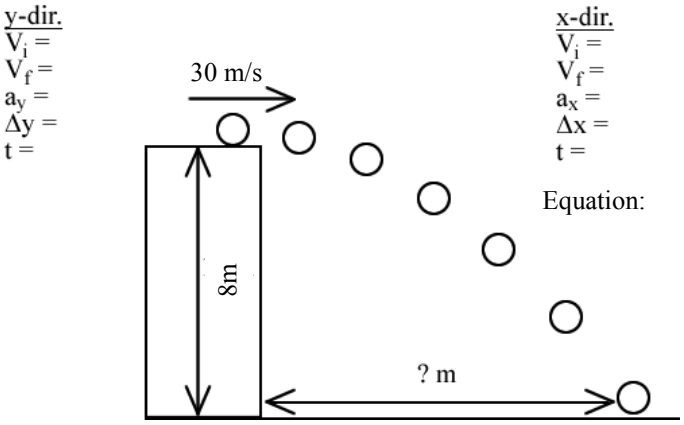
4. A. On the diagram at the left, calculate the x and y components of the given vectors.

      X_1 = _____ Y_1 = _____

      X_2 = _____ Y_2 = _____

      X_{total} = _____ Y_{total} = _____

   B. Draw the resultant and calculate its magnitude and direction.



5. A ball is thrown horizontally off of a 8 m tall ledge with a velocity of 30 m/s.
   A. Fill in the variables on the diagram.

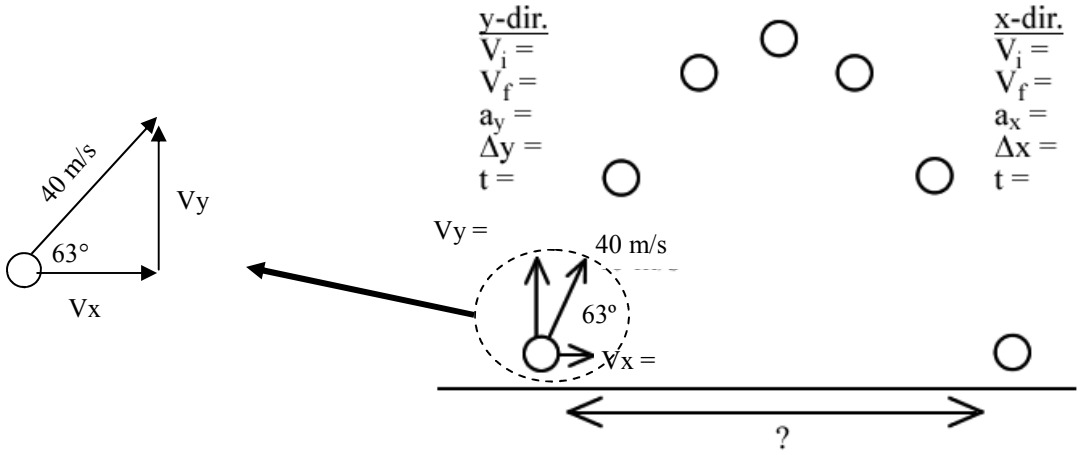
   B. Calculate the time it takes to hit the ground.

   C. Calculate how far away it lands.

From the "Projectile Motion" Notes:

6. How far a projectile travels in the x direction is called the projectile's:

7. What is the shape of a projectile's path?



8. An object is shot 40 m/s at an angle of 63º. It is launched from the ground and lands on the ground as shown above.
   A. The diagram at the left shows how to break up the initial velocity into its components. Calculate Vy_i (initial y-velocity) and Vx_i (initial x-velocity).

   B. Fill in the variables on the diagram at the right. You just calculated your initial x and y velocities in part A.

   C. Calculate the time in the y-direction.

   D. Calculate how far away the projectile landed in the x-direction.