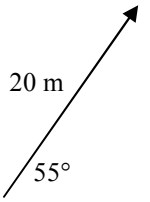
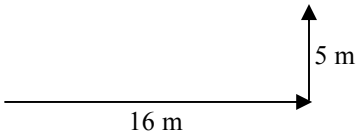
A-Day: Due Tues., Oct 6
B-Day: Due Wed., Oct 7

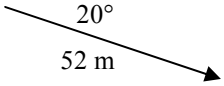
2009 Two Dimensions 3



1. *A person walks 20 m at an angle of 55°.*
   A. From the start of the arrow, draw a horizontal line to the right.
   B. From the end of the arrow (point), draw a vertical line down.
   This is how you draw your x and y-components for any arrow.
   C. Calculate your x and y-components.

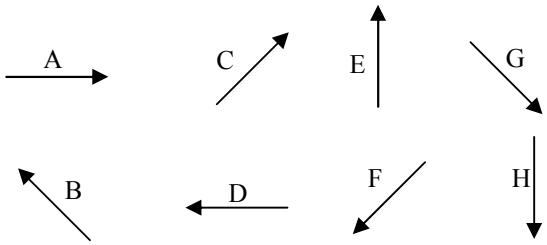


2. Calculate the total displacement and direction from the start of the first arrow above to the end of the last arrow.



3. A. What is the magnitude of the vector at the left?
   B. What is the correct direction for the vector?
   C. Calculate the x and y-components of the vector at the left.

4. Use the arrows at the right to answer the following.
   A. ____Which arrow has + x and –y components? (*which is pointing in the +x and –y directions?)*
   B. ____Which arrow has –x and +y components?
   C. ____Which arrow has +x and no y component?
   D. ____Which arrow/s have no x component?
   E. ____Which arrow is the negative of A?
   F. ____Which arrow = -B?
   G. ____Which arrow has –x and –y components?
   H. What does A + D equal? (*If you walked the direction of A and then the direction of D, what would be your total displacement?)*



Still using the A-H arrows as displacement vectors (distances with directions)….

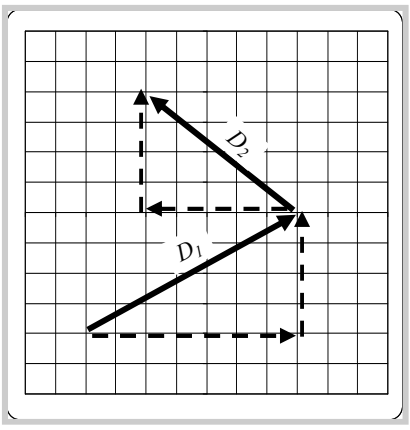
5. A. A strange person (named "Crazy") walks the direction of A, then C, then E, then 2D (D twice). Starting at the point marked "start" draw Crazy's path.

   Start

   B. A second person, standing at the same starting point, watches Crazy walk their crazy path, but being Lazy, walks to Crazy in a straight line. Use an arrow to show Lazy's path. Label this arrow "R" for the resultant.

6. Using the same story of Crazy and Lazy above…
   A. Draw Cray's path: G + F + 2E −2A.

   B. Draw Lazy's path, labeling it "R".

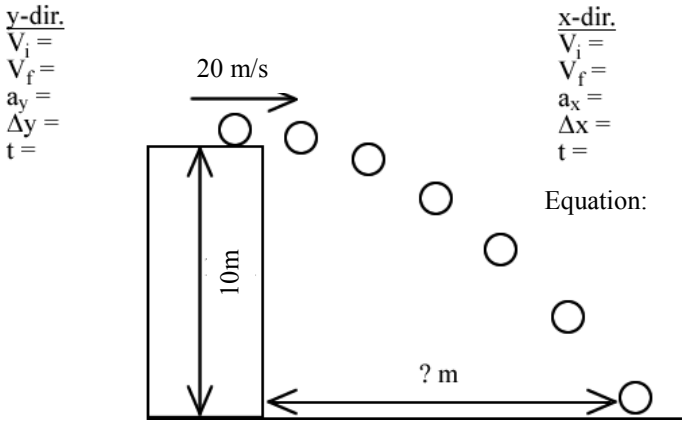


7. Crazy again walks the path shown at the left.
   A. What are the x and y components of D_1? X1 = Y1 =

   B. What are the x and y components of D_2? (*pay attention to negatives)* X2 = Y2 =

   C. Draw Lazy's path from the start to finish.
   D. Keeping track of positives and negatives, what are the x and y components of Lazy's path? X_{total} = Y_{total} =

   E. Calculate D_1's magnitude and direction.



8. *An object is launched horizontally at 20 m/s from the top of a 10 m tall ledge.*
   A. Since it is launched horizontally, what is its initial y-velocity (Vyi)?

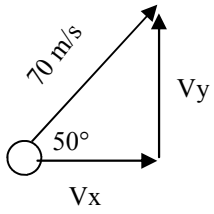
   In the y-direction it is in freefall,

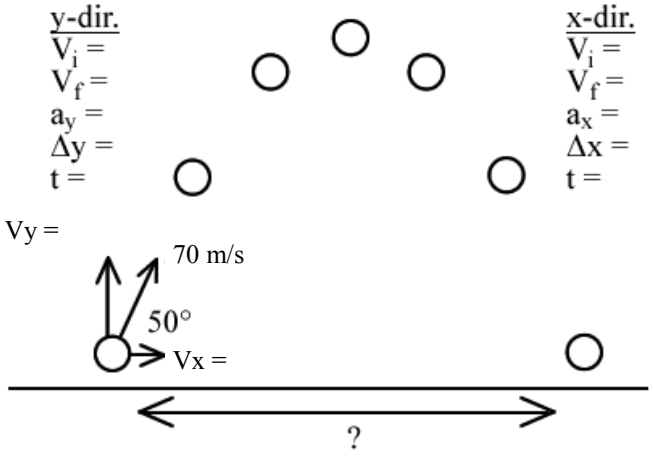
   B. What is a_y?

   In the x-direction it is at constant speed.

   C. What is a_x?
   D. What equation can you use in the x-direction?
   E. Assign variables in both directions.
   F. In the y-direction, calculate the time it takes for the object to fall to the ground.

   G. Using the time you just calculated in the y-direction, calculate the distance it travels in the x-direction.





9. A projectile is launched 70 m/s at an angle of 50°.
   A. On the diagram at the left, calculate the x and y components of the velocity.

   B. Take the Vx and Vy that you just calculated and put them on the diagram below.

   C. Assign variables, knowing that the object is shot from the ground to the ground.

   D. In the x-direction be sure to write the equation you will use.

   E. Calculate the time it is in the air.

   F. Using the time you just found, calculate the distance the projectile travels in the x-direction (known as its range).