# PreAP Two Dimensions 18

1. Scalar or vector?

   A. ____ Does not need direction.
   B. ____ Needs magnitude and direction.
   C. ____ Needs amount only.

   D. ___ Velocity.
   E. ___ Speed.
   F. ___ Acceleration.

   G. ____ Number of pennies on a table.
   H. ____ Mass
   I. ____ Pressure.
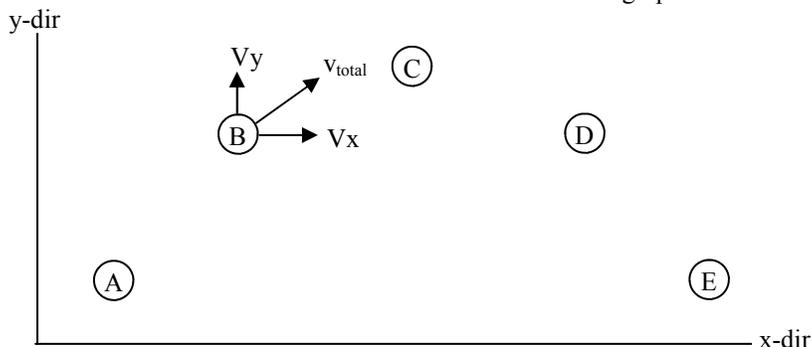
2. The graphic at the left shows the path of a projectile shot ground to ground.

y-dir



   A. On the way up, the y-velocities will: increase; decrease; stay the same?

   B. On the way down, the y-velocities will:

   C. As it goes from A to E, the x-velocities will:

   D. Draw the x and y velocities on each letter. Use longer arrows for greater velocity (they don't have to be perfect).

   E. Draw the total velocity (the speed) of the projectile at each point. The one at point B is done for you, as an example.

3. Answer the following questions about the projectile positions above. The projectile is launched from the ground to the ground. Its initial velocity is V and its initial angle is θ. Some questions may have more than one answer.

   A. Its initial x-velocity is:

   B. Its initial y-velocity is:

   C. Its total velocity at point C is:

   D. Its acceleration at point D is (and give direction):

   E. Its x-velocity at D is:

   F. Where is its speed the greatest (Vtotal)?

   G. Where is its acceleration the smallest?

   H. Compared to its horizontal speed at point B, its horizontal speed at D is:

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

5. Projectile or not?
   A. ____ A falling piece of paper?
   B. ____ A dropped rock?
   C. ____ A rock that is thrown downward after it is let go?
   D. ____ A balloon that is thrown?

6. Four projectile are launched from the ground with the same initial velocity. Their angles of fire are: 30°; 45°; 60°; 80°.

   A. Which one has the most hang time (greatest time in the air)?

   B. Which has the greatest Vx?

   C. Put them in order from greatest range to least range. If they are the same, say so.

7. Three projectiles are shot horizontally with the given velocities shown below. I and II are shot from the same height.
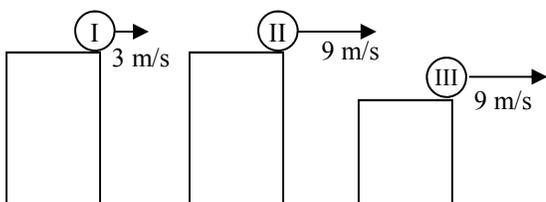


   A. ____ Which is in the air for a greater time: I or II?

   B. ____ Which is in the air for less time: II or III?

   C. ____ Has the greater range: II or III?

   D. ____ Has the greater range: I or II?

   E. Give two ways to increase the range of I: