Two Dimensions 8

1. A cow bird is eating tics off of a cow when it is spooked by a passing car. The bird flies off starting at 2 m/s at an angle of 20° to the ground. The bird accelerates 1.2 m/s² for 4 seconds.

   A. The cow is aided by the removal of the tic. This relationship between the bird and cow is an example of:

   B. Find how much altitude the bird gains. (*Remember that <u>altitude</u> is vertical distance*.)

   (*You might want to find how far the bird flew at 20°, first.*)

   C. If the cow is 1.4 meters high, how high is the bird up in the air (*total—from the ground)?*
   [*Remember that the bird started on the cow.*]

2. A ball is thrown from the ground at 25 m/s at 45° to the ground. Find how high up the ball goes.

   A. Is "how high" in the x or y direction?

   B. What two letters from our diagram is this?

   C. Solve.
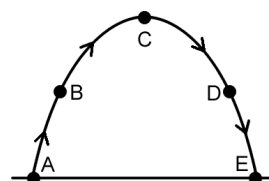
3. A bullet is fired <u>horizontally</u> from a gun aimed directly at a coconut dropped from a tree 5 meters away. The coconut is at the exact same height as the gun and drops at the exact same time the bullet is fired.

   A. Thinking about my demonstration of throwing a ball and dropping a ball at the same time. What is the initial y-velocity of both the coconut and the bullet?

   B. What is the y-direction acceleration for both the bullet and the coconut?

   C. Will the bullet hit the coconut?

   C. Why or why not?
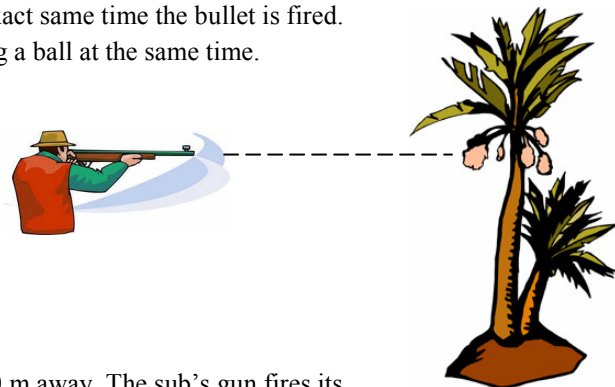
4. A submarine surfaces to fire its 5 in guns at an enemy ship that is 550 m away. The sub's gun fires its projectile at 70 m/s at an angle of 35°. Will they hit the enemy be destroyed? (*Assume both the sub fires and the enemy ship are at sea level.*)

More on back
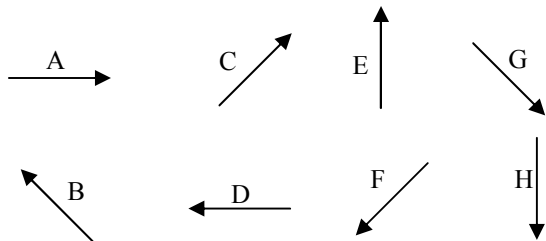
5. What is the resultant of E + 2D + H + A?

6. Draw the resultant of 2A –B + G.

7. A person walks 6 m north, 10 m east, 7 m south, 4 m west, and another 8 m north. Find the total displacement of the person (magnitude and direction). (*Remember that displacement is how far they move from their original position.*)