POE Practice Test - Kinematics

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. _____ is the study of motion without reference to the forces that cause the motion.
   a. Statics
   b. Kinematics
   c. Mechanics
   d. Kinetics

2. A projectile is any moving object upon which the only active force is
   a. wind.
   b. magnetism.
   c. mechanical actuation.
   d. gravity.

3. Neglecting air resistance, the horizontal component velocity of a projectile that moves along the path of a parabolic curve will
   a. increase.
   b. decrease.
   c. remain constant
   d. fluctuate.

4. Neglecting air resistance, which of the following trajectory angles (measured from the horizon) will result in the greatest horizontal distance traveled by a projectile?
   a. 10 degrees
   b. 40 degrees
   c. 70 degrees
   d. 90 degrees

Problem

5.

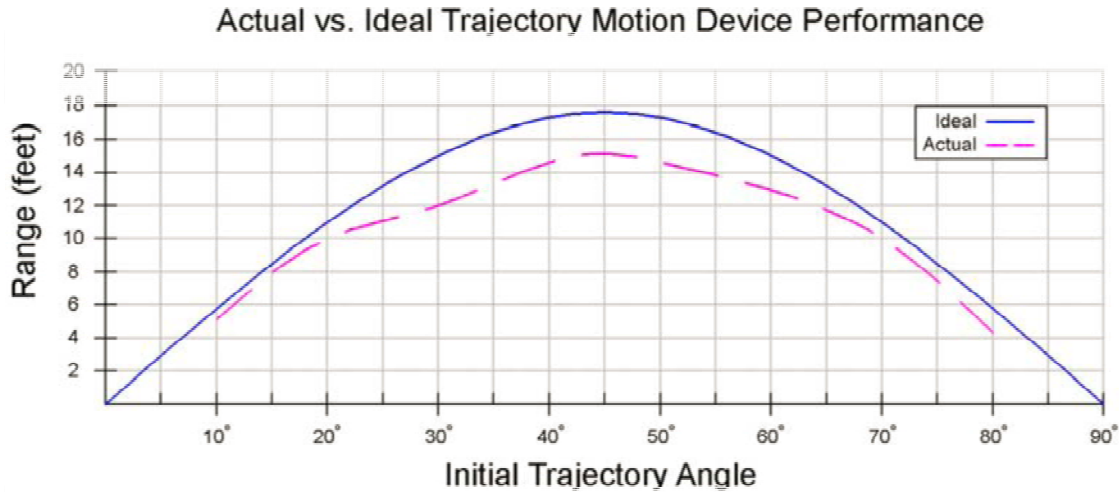Actual vs. Ideal Trajectory Motion Device Performance

Figure 3

The actual performance of a POE student's ballistic device was recorded and plotted for comparison against its calculated ideal performance. Study the graph in Figure 3 and use it to answer the following questions.

a. What two initial trajectory angles could be used to shoot the projectile an *ideal* distance of 6 feet?

angle 1: _____

angle 2: _____

b. What would the *actual* initial velocity be if it were calculated using the results of a 30 degree firing angle? Use 32.15 ft/s/s for acceleration due to gravity. (answer precision = 0.00)

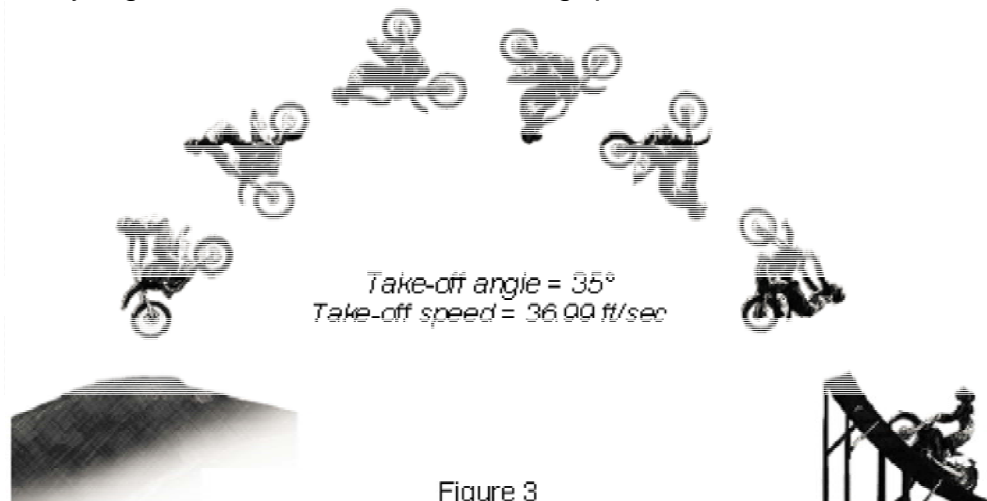6. Study Figure 3 and answer the following questions.

Take-off angle = 35°
Take-off speed = 36.99 ft/sec

Figure 3

a. What was the motorcyclist's initial horizontal velocity? (answer precision = 0.00)

b. What was the horizontal distance between the take-off and landing points? Assume that both points exist on the same horizontal plane. Use 32.15 ft/s/s for acceleration due to gravity. (answer precision = 0.00)