Name _____Answer Key_____ **A** Date _____

Honors Physics Kinematics WS #7H

Period _____ Mrs. Nadworny

MORE Kinematics

Directions: Solve the following problems using the GUESS method. Show all work clearly.

1. Scalar is to vector as

   (A) speed is to velocity
   (B) displacement is to distance
   (C) displacement is to velocity
   (D) speed is to distance

2. Rick O'Shea accelerates his car from 10.7 m/s to 16.1 m/s in 17.0 seconds to pass a bus full of nuns heading north. What is his acceleration?

$$a = \frac{\Delta v}{t} = \frac{16.1\,\frac{m}{s} - 10.7\,\frac{m}{s}}{17.0s} = 0.318\,\frac{m}{s^2} \text{ north}$$

3. Ophelia Paine decelerates her Harley Fatboy at a rate of 0.52 m/s^2 in order to avoid hitting Rick who is passing the bus and coming towards her. If it takes her 5.9 seconds to slow down to 8.8 m/s, what was her initial velocity?

$$v_i = v_f - at = 8.8\,\frac{m}{s} - (-0.52\,\frac{m}{s^2})(5.9s) = 12\ \frac{m}{s} \text{ south}$$

4. Ray Zenz slams on the brakes of his 1969 Camaro SS in order to avoid hitting a family of ducks crossing the road. If his initial velocity was 11.3 m/s, and it took him 25 meters to come to a complete stop, what was his deceleration?

$$a = \frac{-v_i^2}{2d} = \frac{-(11.3\,\frac{m}{s})^2}{2(25m)} = -2.6\,\frac{m}{s^2}$$

5. In the balmy waters off Key Largo Sandy Beech's speedboat can accelerate at a rate of 1.06 m/s^2. How many meters does Sandy travel in her speedboat if she accelerates from 4.91 m/s to 10.37 m/s?

$$d = \frac{v_f^2 - v_i^2}{2a} = \frac{(10.37\,\frac{m}{s})^2 - (4.91\,\frac{m}{s})^2}{2(1.06\,\frac{m}{s^2})} = 39.4 \text{ m}$$

6. The distance record for someone riding a motorcycle on its rear wheel without stopping is more than 320 km. Suppose the rider in this unusual "wheelie" position travels with an initial speed of 9.0 m/s before speeding up. The rider then travels 65 meters at a constant acceleration of 3.5 m/s^2. What is the rider's speed after the acceleration?

$$v_f = \sqrt{v_i^2 + 2ad} = \sqrt{(9.0\,\frac{m}{s})^2 + 2(3.5\,\frac{m}{s^2})(65m)} = 23\,\frac{m}{s}$$

Answers in size order: 0.318, 2.6, 12, 23, 39.4