Name _____Answer Key_____   Date _____

Honors Physics   Kinematics WS #3H

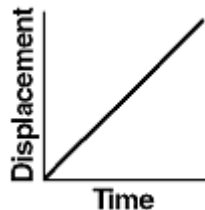Period _____   Mrs. Nadworny

Constant Velocity

Directions: Read textbook pages 45 – 46. Solve the following problems using the GUESS method. Show all work clearly.

1. The graph below represents the motion of an object.

    According to the graph, as time increases, the velocity of the object

    A) decreases   B) remains the same   C) increases

2. One car travels 40. meters due east in 5.0 seconds, and a second car travels 64 meters due west in 8.0 seconds. During their periods of travel, the cars definitely have the same

    A) velocity   B) momentum   C) displacement   D) speed

3. How long does it take a skier to travel 595 meters, going 16.1 m/s?

$$t = \frac{d}{v} = \frac{595 \text{ m}}{16.1 \text{ m/s}} = 37.0 \text{ s}$$

4. A bicycle averages 4.9 m/s while traveling for 11.0 minutes. How far does it travel?

$$11.0 \text{ min} \left(\frac{60 \text{ s}}{1 \text{ min}} \right) = 660. \text{sec}$$

$$d = vt = (4.9 \text{ m/s})(660 \text{ s}) = 3200 \text{ m}$$

5. What is the average speed of a car that travels 5.7×10^4 meters in 1.0 hour? Give your answer in SI units.

$$1.0 \text{ hr} \left(\frac{60 \text{ min}}{1 \text{ hr}} \right) \left(\frac{60 \text{ s}}{1 \text{ min}} \right) = 3600 \text{ sec}$$

$$v = \frac{d}{t} = \frac{5.7 \times 10^4 \text{ m}}{3600 \text{ s}} = 16 \text{ m/s}$$

6. Grant Wishiz rides his bike around the high school and down to the Pulaski Road School. He travels a total distance of 720 meters. The trip takes him 5.3 minutes. What is his average speed in meters/second?

$$\left(\frac{5.3 \text{ min}}{1} \right) \left(\frac{60 \text{ sec}}{1 \text{ min}} \right) = 320 \text{ sec} \qquad v = \frac{d}{t} = \frac{720 \text{ m}}{320 \text{ s}} = 2.3 \text{ m/s}$$

7. Mike travels 4.6 meters east and 2.2 meters south in 3.67 seconds.

    a. What is his displacement?

$$d = \sqrt{a^2 + b^2} = \sqrt{(4.6 \text{ m})^2 + (2.2 \text{ m})^2} = 5.1 \text{ meters SouthEast}$$

    b. Calculate his average speed.

$$v = \frac{d}{t} = \frac{6.8 \text{ m}}{3.67 \text{ s}} = 1.9 \text{ m/s}$$

    c. Calculate his average velocity

$$v = \frac{d}{t} = \frac{5.1 \text{ m}}{3.67 \text{ s}} = 1.4 \text{ m/s SE}$$

8. A dog runs 25 meters to fetch a stick and then returns to his owner. The entire trip takes 5.7 seconds.

    d. Calculate the dog's average speed.

$$v = \frac{d}{t} = \frac{50. \text{ m}}{5.7 \text{ s}} = 8.8 \text{ m/s}$$

    e. Calculate the dog's average velocity.

$$v = \frac{d}{t} = \frac{0 \text{ m}}{5.7 \text{ s}} = 0 \text{ m/s}$$

9. Art Zenkraftz walks 200. meters down Elwood Road then turns right onto Pulaski and walks 250 meters. If she is traveling with an average speed of 0.50 m/s, how long will it take her?

$$t = \frac{d}{v} = \frac{200. \text{ m} + 250 \text{ m}}{0.50 \text{ m/s}} = \frac{450 \text{ m}}{0.50 \text{ m/s}} = 900 \text{ s} = 9.0 \times 10^2 \text{ s}$$

Answers in size order: 0, 1.4, 1.9, 2.3, 5.1, 8.8, 16, 37.0, 9.0 x 10², 3200