

Honors Physics WS2

Show given information, equations, algebra, substitution, and units for full credit. Pay attention to significant figures.

$$1) \frac{[4.6 \times 10^1][2.1 \times 10^{-4}]}{[1.64 \times 10^{34}]} =$$

$$2) [27.3 \times 10^{-22}][2.0 \times 10^{18}] =$$

$$3) \frac{[4.2 \times 10^{14}][9.4 \times 10^7]}{[6.4 \times 10^9]} =$$

$$4) \frac{[1.7 \times 10^9][3.9 \times 10^7]}{[1.40 \times 10^{-6}]} =$$

Formulas: $v = \frac{\Delta x}{\Delta t}$ $a = \frac{\Delta v}{\Delta t}$ $x_f = x_i + v_i t = \frac{1}{2} a t^2$ $v_f^2 - v_i^2 = 2a\Delta x$

6) Light travels in a straight line at 3.0×10^8 m/s. What is its acceleration? Why?

7) How much time would it take to drive 80 miles if you had an average speed of 50 miles per hour?

8) A train travels at 60 mi/hr for 3.5 hrs. How far did it travel?

10) A car accelerates from 3.27 m/s to 15.55 m/s in 4.0 seconds flat. What is its acceleration?

11) A bicycle is traveling 5 m/s at the top of a hill. When it reaches the bottom 6 seconds later it has a speed of 25 m/s. What is the acceleration?

12) It takes a bicycle 5 seconds to increase its speed from 3 m/s to 18 m/s. What is the average rate of acceleration?

Name _____ Period _____ Date _____

- 13) A car accelerates from a position of rest to 50 m/s in 20 seconds. First determine the rate of acceleration, then calculate the speed of the car at the end of the first 6 seconds.
- 14) If acceleration due to gravity is 9.8 m/s^2 , what is the final velocity of a falling object when it hits the ground if it started at rest and took 5 seconds to fall? Use $x = \frac{1}{2} gt^2$, where g = acceleration due to gravity, t = time falling.
- 15) Karl decelerates for 3.00 sec from 12.0 m/s at a rate of -2.0 m/s each second. What is his final speed?
- 16) Mary is racing in her car at 35.0 m/s when she sees a dog and must come to a stop in 12.0 m. What must be Madolyn's deceleration in order to save the dog?
- 17) Extension from our California Screamin' ride problem today – if the ride's acceleration is 6.2 m/s^2 at the beginning and goes from 0 to 89 km/hr, what is its final position if we say the initial position is 0?
- 18) Acceleration... (circle one)
- a. is the rate of change of velocity
 - b. reflects a change in speed **or** a change in direction
 - c. is zero when an object is at constant velocity
 - d. all of the above
- 19) Explain how velocity can be positive when acceleration is negative.