Name_____ Period _____ Date_____

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? **0**

7) How much time would it take to drive 80 miles if you had an average speed of 50 miles per hour? **1.6 hours**

8) A train travels at 60 mi/hr for 3.5 hrs. How far did it travel? **200 miles**

10) A car accelerates from 3.27 m/s to 15.55 m/s in 4.0 seconds flat. What is its acceleration? **3.07 m/s^2**

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? **3 m/s^2**

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? **3 m/s^2**

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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 $x = ½ gt^2$, 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 -2.0m/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 Mary'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.