Name_____

Kinematics

Solve the following problems. You ***MUST*** show all work if you wish to receive credit. Be sure each of the following steps are included in each problem**: KNOW, FIND, EQUATION, SOLUTION**.

1. Diego feels like his car can beat Mr. Morrill's Camary. One day they find themselves at a red light on State Street. With calculators drawn they decide to see who car is the fastest.
   a. Diego's Dodge Durango can go from a speed of 3 m/s to a speed of 15 m/s in a time of 6 seconds. What is Diego's acceleration?

   b. Mr. Morrill's Camary can go from rest to 60 m/s in 25 seconds. What is Mr. Morrill's acceleration?

2. Kylie discovers that she may be late for physics if she does not get a move on. She decides to run to class. Starting with a speed of 3 m/s, she estimates that she will need to reach a speed of 8 m/s if she is to make it to class on time. If she is only able to produce and acceleration of 0.2m/s2, how long will it take for her to reach her final speed?

3. Rachel is sitting on here scooter in the Target parking lot when for some strange reason she decides to do some physics. She performs some quick measurements and records that it took her 20 seconds to reach a speed of 25 m/s. Her scooter is able to produce and acceleration of 0.03 m/s2. What was her initial speed?

4. A space probe is to be launched into deep space from an orbiting satellite. The probe has an initial speed of 5000 m/s, and the engines are able to produce and acceleration of 50 m/s2 (about 5g's). What will be the final speed of the probe if it has enough fuel for 15 minutes?

5. A bullet leaves a rifle with a muzzle velocity of 520 m/s, If the bullet starts from rest, and it takes 0.005 seconds to reach the end of the barrel, what is the acceleration of the bullet?