Name: _____
Date: _____ Block: _____

Kinematics Problems

1. A driver in a car traveling at a speed of 21.8 m/s sees a cat 101 m away on the road. How long will it take the car to accelerate uniformly to a stop in exactly 99 m?

2. A car enters the freeway with a speed of 6.4 m/s and accelerates uniformly for 3.2 km in 3.5 min. How fast (in m/s) is the car moving after this time?

3. A car starts from rest and travels for 5.0 s with a constant acceleration of -1.5 m/s^2. What is the final velocity of the car? How far does the car travel in this time interval?

4. A driver in a car at 15.0 m/s applies the breaks, causing a uniform acceleration of -2.0 m/s^2. How long does it take the car to accelerate to a final speed of 10.0 m/s? How far has the car moved during the breaking period?

5. A car traveling initially at +7.0 m/s accelerates uniformly at the rate of +0.80 m/s^2 for a distance of 245 m.
    a. What is its velocity at the end of the acceleration?

    b. What is its velocity after it accelerates for 125 m?

    c. What is its velocity after it accelerates for 67 m?

6. An aircraft has a liftoff speed of 33 m/s. What minimum constant acceleration does this require if the aircraft is to be airborne after a take-off run of 240 m?

7. A certain car is capable of accelerating at a uniform rate of 0.85 m/s^2. What is the magnitude of the car's displacement as it accelerates uniformly from a speed of 83 km/h to one of 94 km/h?