Problem-solving when velocity is not constant Part 3

We will whiteboard and discuss these problems as a class.

Solve each problem using the models we have developed in class. Show both an algebraic solution, and a graphical solution using a v vs. t graph. Rely on the SEF if you get stuck. **DO THE WORK ON SEPARATE SHEETS OF PAPER OR IN YOUR NOTEBOOK.**

1. A poorly tuned Toyota Celica can accelerate from rest to a speed of
    28 m/s in 20 s.
    a) What is the average acceleration of the car?
    b) What distance does it travel in this time?

2. At t = 0 a truck has a speed of 30 m/s. At t = 6 s, its speed is 14 m/s.
    a.) What is its average acceleration during this time interval?

3. A dog spies a squirrel and takes off from rest, accelerating at a rate of 2.0 m/s^2. If the squirrel is 16 m away, how fast is the dog going when he gets to the squirrel?

4. A bus moving at 20 m/s (t = 0) slows at a rate of 4 m/s each second.
    a) How long does it take the bus to stop?
    b) How far does it travel while braking?

5. A physics student (starting from rest) skis down a hill, accelerating at a constant 2.0 m/s^2.
    a.) If it takes her 15 s to reach the bottom, what is the length of the slope?

6. A dog runs down his driveway with an initial speed of 5 m/s for 8 s, and then uniformly increases his speed to 10 m/s in 5 s.
    a) What was his acceleration during the 2nd part of the motion?
    b) How long is the driveway?

7. A car whose initial speed is 30 m/s slows uniformly to 10 m/s in 5 seconds.
    a) Determine the acceleration of the car.
    b) Determine the distance it travels in the 3rd second
    (t = 2s to t = 3s).