$\qquad$ Name: $\qquad$ Pd. $\qquad$

## 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 $28 \mathrm{~m} / \mathrm{s}$ 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 $30 \mathrm{~m} / \mathrm{s}$. At $\mathrm{t}=6 \mathrm{~s}$, its speed is $14 \mathrm{~m} / \mathrm{s}$.
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 $2.0 \mathrm{~m} / \mathrm{s}^{2}$. If the squirrel is 16 m away, how fast is the dog going when he gets to the squirrel?
4. A bus moving at $20 \mathrm{~m} / \mathrm{s}(\mathrm{t}=0)$ slows at a rate of $4 \mathrm{~m} / \mathrm{s}$ 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 $2.0 \mathrm{~m} / \mathrm{s}^{2}$.
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 $5 \mathrm{~m} / \mathrm{s}$ for 8 s , and then uniformly increases his speed to $10 \mathrm{~m} / \mathrm{s}$ in 5 s .
a) What was his acceleration during the 2 nd part of the motion?
b) How long is the driveway?
7. A car whose initial speed is $30 \mathrm{~m} / \mathrm{s}$ slows uniformly to $10 \mathrm{~m} / \mathrm{s}$ in 5 seconds.
a) Determine the acceleration of the car.
b) Determine the distance it travels in the 3rd second $(\mathrm{t}=2 \mathrm{~s}$ to $\mathrm{t}=3 \mathrm{~s})$.
