

Physical Science II

Equations of Motion Continued

Mr. Menin

NAME _____ SEC _____ DATE _____

To this point our study of motion we've developed the following equations (*for situations when acceleration is constant*):

$$d = \left(\frac{1}{2}\right)(V_i + V_f)(t)$$

$$d = V_i t + \left(\frac{1}{2}\right)at^2$$

$$V_f = V_i + at$$

$$V_f^2 = V_i^2 + 2ad$$

V_i means "initial speed," the speed at the start of the motion.

V_f means "final speed," the speed at the end of the motion.

1. A car going 23 mph speeds up to 75 mph in just 3.5 seconds.

a) What is its acceleration?

b) How far does it go during this time?

2. A toy plane going 12 m/s accelerates at 1.4 m/s² for 2.8 seconds. How far does it go during this time?

3. A plane can accelerate down the runway at 1.8 m/s². At the beginning of the runway it is sitting still. At the end it is going 70 m/s. How long does the runway have to be?

4. (*Optional for Sections A, B & F - Required for Sections C & E*) A car going 11 m/s sees a yellow light 35 m ahead. Naturally enough, he floors it and accelerates at 5.8 m/s². How long does it take him to get to the intersection? (*Hint: Think "Quadratic Equation"*)