

## Kinematics 1-D : Notes/W.S.-7

Two of the equations of kinematics are;

$$V_f = V_i + a \cdot t$$

and;

$$D = \frac{1}{2} \cdot a \cdot t^2$$

Answer the following questions using the above equations.

1) A car accelerates from rest at  $2.4\text{m/s}^2$ .

a) The velocity at time  $t = 6.5 \text{ s}$  is \_\_\_\_\_ .

b) The distance traveled in the first 6.5 seconds is \_\_\_\_\_ .

2) A rock falls off of a cliff. The acceleration due to gravity is  $-9.8\text{m/s}^2$ .

a) The velocity of the rock after 3.2 seconds is \_\_\_\_\_ .

b) The distance the rock falls in 3.2 seconds is \_\_\_\_\_ .

3) At time  $t = 0.0 \text{ s}$ , a car has a velocity of  $15 \text{ m/s}$ . It slows down to  $7.0 \text{ m/s}$  in  $4.0 \text{ seconds}$ . It then keeps slowing down at this rate until it stops.

a) The acceleration of the car is \_\_\_\_\_ .

b) The time it takes for the car to come to a stop is \_\_\_\_\_ .

4) A projectile is fired upwards with a velocity of  $48 \text{ m/s}$ . The acceleration is  $-9.8\text{m/s}^2$ .

a) Find the velocity at  $t = 2.0\text{s}$ . \_\_\_\_\_

b) Find the time it takes to reach its maximum height. (hint: at the maximum height,  $V = 0.0 \text{ m/s}$ ). \_\_\_\_\_

c) Find the velocity at  $t = 7.0\text{s}$ . \_\_\_\_\_

Answers: 1)a) 16 m/s, b) 51 m, 2)a) -31 m/s, b) 50. m, 3)a)  $-2.0\text{m/s}^2$ ,  
b) 7.5s, 4)a) 28 m/s, b) 4.9s, c) -21 m/s.