Physics 101 Rec
Quiz#1
Chapter 2

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Name: _____ Key _____ Id: _____ Sect: _____

The position of a particle as a function of time is given by the equation

$$x = 3t^2 - 5t + 20$$

where x is in centimeters and t in seconds.

(a) What is displacement of the particle during the time interval t = 2 and t = 4 sec?

$$X_2 = 3(4)^2 - 5(4) + 20 = 48 \text{ cm}$$
$$X_1 = 3(2)^2 - 5(2) + 20 = 22 \text{ cm}$$
$$\Delta X = X_2 - X_1 = 48 - 22 = \boxed{26 \text{ cm}}$$

(b) What is the average acceleration of the particle during the time interval t = 2 and t = 4 sec?

$$V = \frac{dx}{dt} = 6t - 5$$
$$a = \frac{dv}{dt} = 6 \text{ cm/s}^2 \qquad \boxed{\bar{a} = 6 \text{ cm/s}^2 = \text{Constant}}$$

(c) What is the velocity of the particle at t = 2 sec?

$$V = 6(2) - 5 = 12 - 5 = \boxed{7 \quad \text{cm/s}}$$

(d) At what position is the particle velocity zero?

$$V = 6t - 5 = 0 \implies t = \frac{5}{6} = 0.83 \text{ sec}$$

$$X = 3(0.83)^2 - 5(0.83) + 20$$
$$= \boxed{18 \text{ cm}}$$

This is page: 1