UNIVERSITY OF MARYLAND

Department of Physics

Physics 161, Calculus Mechanics and particle dynamics

Quiz #3

1. The position of a particle is given by: $\vec{x}(t) = \{(t-2)m\}\hat{x} + \{(t^2 + 3t - 2)m\}\hat{y}$

   a) Find the instantaneous velocity in vector component form and evaluate the vector at time t = 2sec.
   b) Find the instantaneous acceleration in vector component form and evaluate the vector at time t =2sec.

2. A moving particle starts with an initial position of $\vec{r}(0) =< 0,1,0 >$ with an initial velocity of $\vec{v}(0) = -\hat{x} + \hat{y} - \hat{z}$. The particle's acceleration is given by $\vec{a}(t) = 2t\hat{x} + 3t\hat{y} - \hat{z}$. Find the particles velocity and position at time t for all times. After you have found the velocity and position calculate the magnitude of the vectors at t = 1sec, t = 5sec and t = 10 sec.