Please PRINT your name _____

No calculators, cell phones, computers, notes, etc.

Circle your answer. Make your work **correct**, **complete** and **coherent**.

The quiz is worth 5 points. The solutions will be posted on my website later today.

Quiz 10, October 7, 2019

The position vector of a particle in the *xy*-plane at time t is
$$\vec{r}(t) = (t+1)\,\vec{i} + (t^2-1)\,\vec{j}.$$

(a) Eliminate the parameter and find an equation in x and y whose graph is the path of the particle.

(b) Find the velocity vector of the particle at $t = 1$.

(c) Find the acceleration vector of the particle at $t = 1$.

ANSWER:

(a) We are given $x = t+1$ and $y = t^2-1$. We eliminate t by dropping $x-1 = t$ into $y = t^2-1$. We obtain $\boxed{y = (x-1)^2 - 1}$.

(b) The velocity of the particle at time t is $\vec{v}(t) = \vec{i} + 2t\,\vec{j}$. The velocity of the particle at time $t = 1$ is $\boxed{\vec{v}(1) = \vec{i} + 2\,\vec{j}}$.

(c) The acceleration of the particle at time t is $\vec{a}(t) = 2\,\vec{j}$. The velocity of the particle at time $t = 1$ is $\boxed{\vec{a}(1) = 2\,\vec{j}}$.