NAME: ID#:

SHOW ALL YOUR WORK

1. (**3points**) Which points on $x = 3t + t^2, y = t^3 - 12$ have tangents with slope 3?

2. (**3points**) Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at the point $(1,3)$ on the curve $x = e^{-t}, \; y = 3\cos t$.

3. (**4points**) Eleminate t and sketch the resulting curve for $x = 2\cos t, y = \sin t, \; -\frac{\pi}{2} < t < \frac{\pi}{2}$. Indicate with an arrow the direction in which the curve is traced as t increases.