Remember that quizzes are based on random problems from this worksheet. Please endeavor to work through these problems before the end of each discussion.

1. Find an equation of the tangent to the curve at the point corresponding to the given value of the parameter.
   a) \( x = 1 + 4t - t^2, \quad y = 2 - t^3, \quad t = 1 \).
   b) \( x = t \cos t, \quad y = t \sin t, \quad t = \pi \).

2. Find \( \frac{dy}{dx} \) and \( \frac{d^2y}{dx^2} \). For what values of \( t \) is the curve concave upward?
   \( x = t^2 + 1, \quad y = t^2 + t \).
3. Find points on the curve where the tangent is horizontal or vertical.

\[ x = t^3 - 3t, \quad y = t^3 - 3t^2. \]