Calculus Chapter 5 Morning Test Review (WS #4) - Logs/Exponential Functions and Derivatives

1) The position function is given. The particle moves along the x-axis for all Real number values of t. $x(t) = t^2 e^{-t}$

a) Find v(t) and a(t)
b) Determine the interval that the particle is moving to the left
c) Is the particle's velocity increasing or decreasing at t = 3? (Justify with because statement)
d) Is the particle's speed increasing or decreasing at t = 3? (Justify with because statement)

2) $find\ \frac{dy}{dx}$ $y = (3 - 5x)^{2^x}$

3) $find\ y'$ $\quad y = 3log_7\left(\frac{x}{(e^{2x})\sqrt{1-3x^2}}\right)$

4) $find\ \frac{dy}{dx}$ $\quad ln\left(\frac{\sqrt[3]{y}}{x^5}\right) = 3x^2y - y + 5x - 3$

5) Find the tangent line equation for the function $f(x) = e^{-x}(\ln x)$ at (1, 0)