1. False. Critical points can also occur where the derivative is undefined, or at endpoints.

2. False. The function $f(x) = x$ is a counterexample.

3. (a) I expected a drawing of a sphere with radius 200cm, and some indication that the volume was decreasing by 10cm^3 per minute.

   At $r = 20\text{cm}$, we plug into the given formula for the volume of a sphere to get that $V = \frac{4}{3}\pi(20)^3 = \frac{32000\pi}{3}$.

   (b) $V(t) = \frac{4}{3}\pi(r(t))^3$.

   (c) $V'(t) = 4\pi(r(t))^2 r'(t)$.

   (d) Plug in $V'(t) = -10$ (the rate at which the volume is decreasing), $r = 20\text{cm}$ (the specified radius), and solve for $r'(t)$.

$$-10 = 4\pi(20)^2 r'(t) \to r'(t) = -\frac{10}{1600\pi}$$