1. False. If the second derivative is 0 at a critical point, then the second derivative test is inconclusive.

2. False, for example any constant term cannot be recovered from the derivative.

3. (a) I expected a drawing of a sphere with radius 100cm, and some indication that the volume was decreasing by 5cm^3 per minute.

   At $r = 10\text{cm}$, we plug into the given formula for the volume of a sphere to get that $V = \frac{4}{3}\pi(10)^3 = \frac{4000\pi}{3}$.

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

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

   (d) Plug in $V'(t) = -5$ (the rate at which the volume is decreasing), $r = 10\text{cm}$ (the radius at the specified time), and solve for $r'(t)$.

$$-5 = 4\pi(10)^2 r'(t) \to r'(t) = -\frac{5}{400\pi}$$