Nr. 3) a) $J_0(x) = \int_0^x t^2\,dt = \left[\frac{t^3}{3}\right]_0^x = \frac{x^3}{3} - 0 = \frac{1}{3}x^3$

$J_0'(x) = \frac{3}{3}x^2 = x^2 = f(x)$

b) $J_2(x) = \int_2^x t^2\,dt = \left[\frac{t^3}{3}\right]_2^x = \frac{x^3}{3} - \frac{8}{3} = \frac{1}{3}(x^3-8)$

$J_2'(x) = \frac{1}{3}(3x^2-0) = x^2 = f(x)$

c) $J_0(x) = \int_0^x (e^t+1)\,dt = \left[e^t+t\right]_0^x = e^x + x - \{e^0+0\} = e^x + x - 1$

$J_0'(x) = e^x + 1 = f(x)$

d) $J_{-2}(x) = \int_{-2}^x \sin(2t)\,dx = \left[-\cos(2t)\cdot\frac{1}{2}\right]_{-2}^x =$

$-\cos(2x)\cdot\frac{1}{2} - \{-\cos(-4)\cdot\frac{1}{2}\} = -\frac{1}{2}\cos(2x) + \frac{1}{2}\cos(-4)$

$J_{-2}'(x) = -\frac{1}{2}\cdot(-\sin(2x)\cdot 2 + 0 = +\sin(2x) = f(x)$