Quiz 4

Problem 1 (3 pts) Compute dz given the following information.

$$z = \frac{y^2 + 2x}{y^2 - 7x} \qquad x = 0, y = 2 \qquad dx = .1, dy = .1$$

Problem 2 (3 pts) Compute the 4th order Taylor polynomial $P_4(x)$ of $x \sin(x)$.

Problem 3 (4 pts) A population model for a particular population of asexually reproducing microbes states that the population $y(t)$ as a function of time (in days) solves the ODE

$$y'(t) = \frac{k}{2}y^3 e^{-at}$$

Suppose that $k = 1$ and $a = 1$. Find $y(t)$ assuming that there is 1 microbe initially.