

Homework 6 Yuankai Wang

Question 1 a) $\frac{dy}{dx} = \begin{pmatrix} \frac{\partial y_1}{\partial x_1} & \frac{\partial y_1}{\partial x_2} \\ \frac{\partial y_2}{\partial x_1} & \frac{\partial y_2}{\partial x_2} \end{pmatrix} = \begin{pmatrix} \frac{x_1}{2\sqrt{x_1x_2}} & x_1 e^{x_2} \\ \frac{x_1}{2\sqrt{x_1x_2}} & 2x_2 + x_1 e^{x_2} \end{pmatrix}$

When $x = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$ $\frac{dy}{dx} = \begin{pmatrix} \frac{1}{2} & e \\ \frac{1}{2} & 2+e \end{pmatrix}$