ComS 474
Homework 5

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1) $\begin{pmatrix} 0.5 & 0.2 & 0.9 \\ -3 & -40 & 1.5 \end{pmatrix}$

2) $\begin{pmatrix} 1.6 & -36.5 \\ 2 & -41.5 \end{pmatrix}$ and $\begin{pmatrix} 1.6 & 2 \\ -36.5 & -41.5 \end{pmatrix}$

3) There is no product AB because their dimensions are not compatible.
Cols in A != # Rows in B

4) $\begin{pmatrix} 1.6 & -36.5 \\ 2 & -41.5 \end{pmatrix} + 1 = \begin{pmatrix} 2.6 & -35.5 \\ 3 & -40.5 \end{pmatrix}$

5) $\frac{\delta E}{\delta \hat{y}} = \frac{\delta(\hat{y}-y)^2}{\delta \hat{y}} = 2(\hat{y} - y) = 2(w^T x - y)$

6) $\hat{y} = \phi(w^T x) = (1 * 5)^2 + (0 * 4)^2 + (1 * 6)^2 + (0 * 1)^2 = 61$

7) $\frac{\delta E}{\delta x_1} = \frac{\delta((w_0 x_0)^2+(w_1 x_1)^2+(w_2 x_2)^2+(w_3 x_3)^2-y)}{\delta x_1} = 2w_1^2 = 2(4)^2 = 32$

$\frac{\delta E}{\delta w_1} = \frac{\delta((w_0 x_0)^2+(w_1 x_1)^2+(w_2 x_2)^2+(w_3 x_3)^2-y)}{\delta w_1} = 2x_1^2 = 2(0)^2 = 0$

8) $\frac{\delta E}{\delta x} = 2w_0^2 + 2w_1^2 + 2w_2^2 + 2w_3^2 = 2(5)^2 + 2(4)^2 + 2(6)^2 + 2(1)^2 = 156$

$\frac{\delta E}{\delta x} = 2x_0^2 + 2x_1^2 + 2x_2^2 + 2x_3^2 = 2(1)^2 + 2(0)^2 + 2(1)^2 + 2(0)^2 = 4$