DSC 40A - Discussion 04 - Matrix Calculus

February 11, 2020

Problem 1.

$$\frac{d(||\vec{x}||^2)}{d\vec{x}} =?$$
$$\vec{x} \in R^d$$

Problem 2.

$$\frac{d(\vec{a}^T\vec{x})^3}{d\vec{x}} =?$$
$$\vec{x} \in R^d, \vec{a} \in R^d$$

Problem 3.

$$\frac{d||X\vec{w} - \vec{y}||^2}{d\vec{w}} =?$$
$$X \in R^{n\times(d+1)}, \vec{y} \in R^n, \vec{w} \in R^{d+1}$$

Problem 4.

$$\frac{d(\vec{y}^T X\vec{w})}{d\vec{w}} =?$$
$$X \in R^{n\times(d+1)}, \vec{y} \in R^n, \vec{w} \in R^{d+1}$$