Home Work 1

Question (1) Math Review (25 points)

Question (1_1): $f(x, y, z) = 3x^2 + sin(y)z$**, I need to find partial derivatives for each x,y, and z:**

Solution:

With respect to x: $\frac{\partial f(x,y,z)}{\partial x} = 6x$, everything else is constant as they don't have x in their representation.

With respect to y: $\frac{\partial f(x,y,z)}{\partial y} = z\cos(y)$, the first term derivative is zero in this case.

With respect to z: $\frac{\partial f(x,y,z)}{\partial z} = \sin(y)$, the first term derivative is also zero in this case.

Question (1_2): In this question, I will need to find the $\nabla f(x, y, z)$**:**

Using the results from the previous question, $\nabla f(x, y, z) = [6x,\ z\cos(y),\ \sin(y)]$

Question (1_3): Here we are replicating 1 and 2 but $f(x) = 3x_1^2 + \sin(x_2)x3$**:**

$\nabla f(x_1, x_2, x_3) = [6x_1,\ x_3\cos(x_2),\ \sin(x_2)]$