Unit 2: Multivariate Calculus Quiz

Question 1

Find the partial derivatives if the following functions:

A) $f(x, y) = x^4 y + 2x$

$\frac{df(x,y)}{dx} =$

$\frac{df(x,y)}{dy} =$

B) $f(x, y) = 2y + 3x^2$

$\frac{df(x,y)}{dx} =$

$\frac{df(x,y)}{dy} =$

Question 2

The direction of maximum **<u>decrease</u>** for an objective function $f(\mathbf{x})$ is given by the:

A. Gradient (∇)

B. Negative Gradient $(-\nabla)$

C. Jacobian Matrix $(\mathbf{J})$

D. Laplacian (∇^2)

Question 3

Fill in the blank: The _____ integral of $f(x)$ is a number and represents the area under the curve from $x = a$ to $x = b$. The _____ integral of $f(x)$ has no limits and returns a function.

Question 4

The critical point of a convex function is guaranteed to be a _____ minimum.

Question 5

Find the global minimum for the objective function, $f(x) = 2x^2 - 3$.