1. Given that $f(x, y) = x^2 y + 3x^2$, find its derivative with respect to x, i.e., find $\frac{\partial f}{\partial x}$.

1 / 1 point

Note: Please use * to indicate the product in the answer. So, if we would write the entire function f as an answer, it would be x^2 * y + 3 * x^2.

$2xy + 6x$

2*x*y + 6*x

Correct

2. Given that $f(x, y) = xy^2 + 2x + 3y$ its gradient, i.e., $\nabla f(x, y)$ is:

1 / 1 point

- ○ $\begin{bmatrix} 2xy + 3 \\ y^2 + 2 \end{bmatrix}$
- ○ $\begin{bmatrix} 2xy \\ 2x + 3 \end{bmatrix}$
- ◉ $\begin{bmatrix} y^2 + 2 \\ 2xy + 3 \end{bmatrix}$
- ○ $\begin{bmatrix} 2y \\ 0 \end{bmatrix}$

Correct

Correct! Applying the gradient's formula: $\nabla f(x, y) = \begin{bmatrix} \frac{\partial f}{\partial x} \\ \frac{\partial f}{\partial y} \end{bmatrix}$, you can get the result!

3. Let $f(x, y) = x^2 + 2y^2 + 8y$. The minimum value of f is:

1 / 1 point

Hint: The question asks for the **minimum value that the function can output, and not the point (x,y) that gives it.**

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Correct

You are correct! Finding the x and y values that satisfies $\nabla f(x, y) = \left(\frac{\partial f}{\partial x}, \frac{\partial f}{\partial y}\right) = (0, 0)$ and then applying them to $f(x, y)$ gives you the correct result!

4. The gradient of $f(x, y, z) = x^2 + 2xyz + z^2$ is:

1 / 1 point

- (selected) $\begin{bmatrix} 2x + 2yz \\ 2xz \\ 2xy + 2z \end{bmatrix}$
- $\begin{bmatrix} 2x + 2xz \\ 2yz \\ 2xy + z \end{bmatrix}$
- $\begin{bmatrix} 2x + 2yz \\ 2xy \\ 2xy + z \end{bmatrix}$
- $\begin{bmatrix} 2yz + 2xz \\ 2z \\ 2x \end{bmatrix}$

Correct

Correct!