

Please PRINT your name _____

No calculators, cell phones, computers, notes, etc.

Circle your answer. Make your work correct, complete and coherent.

The quiz is worth 5 points. The solutions will be posted on my website later today.

Quiz 12, Wednesday, November 4, 2020

Find the derivative of the function $f(x, y) = 2xy - 3y^2$ at $P_0 = (5, 5)$ in the direction of $\vec{u} = 4\vec{i} + 3\vec{j}$.

Answer:

$$\begin{aligned} D_{\vec{u}}f|_{P_0} &= \vec{\nabla}f|_{P_0} \cdot \frac{\vec{u}}{|\vec{u}|} = (2y\vec{i} + (2x - 6y)\vec{j})|_{(5,5)} \cdot \frac{4\vec{i} + 3\vec{j}}{5} \\ &= (10\vec{i} - 20\vec{j}) \cdot \frac{4\vec{i} + 3\vec{j}}{5} = (2\vec{i} - 4\vec{j}) \cdot (4\vec{i} + 3\vec{j}) = 8 - 12 = \boxed{-4}. \end{aligned}$$