

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 15, October 23, 2019

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

ANSWER:

We calculate

$$\begin{aligned} D_{\vec{u}}f|_{P_0} &= \vec{\nabla}f|_{P_0} \cdot \frac{\vec{u}}{|\vec{u}|} = \left((2y\vec{i} + (2x - 6y)\vec{j}) \Big|_{(5,5)} \right) = (10\vec{i} - 20\vec{j}) \cdot \frac{1}{5}(4\vec{i} + 3\vec{j}) \\ &= \frac{40 - 60}{5} = \boxed{-4}. \end{aligned}$$