Please PRINT your name _____

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

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

Please take a picture of your quiz (for your records) just before you turn the quiz in. I will e-mail your grade and my comments to you. I will return your quiz when I next see you.

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

Quiz 6, October 28, 2024

Let $f(x,y) = 2xy - 3y^2$, $P = (5,5)$, and $\vec{v} = 4\vec{i} + 3\vec{j}$. Find $D_{\vec{v}}f|_P$. (That is, find the directional derivative of f in the direction of $\vec{v}$ at the point P.)

Answer:

$$D_{\vec{v}}f|_P = \vec{\nabla}f|_P \cdot \frac{\vec{v}}{|\vec{v}|}$$

$$= (2y\vec{i} + (2x - 6y)\vec{j})|_{(5,5)} \cdot \frac{4\vec{i} + 3\vec{j}}{\sqrt{16+9}}$$

$$= (10\vec{i} - 20\vec{j}) \cdot \frac{4\vec{i} + 3\vec{j}}{5}$$

$$= (2\vec{i} - 4\vec{j}) \cdot (4\vec{i} + 3\vec{j})$$

$$= 8 - 12 = \boxed{-4}$$