"QUIZ" for Lecture 8

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E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: qXFirstLast.pdf) ASAP BUT NO LATER THAN Oct. 1, 2020, 8:00pm

1. Find the directional derivative of the function $f(x, y, z) = xy^2z^3$ at the point $(2, 1, 1)$ in the direction $\langle 2, -1, -1 \rangle$.

$f(x,y,z) = xy^2z^3$ $\quad \langle 1,4,6 \rangle \cdot \langle 2,-1,-1 \rangle$

$2 - 4 - 6$

-8

$\left\langle \frac{d}{dx}(xy^2z^3), \frac{d}{dy}(xy^2z^3), \frac{d}{dz}(xy^2z^3) \right\rangle$

$\langle y^2z^3, 2yxz^3, 3z^2xy^2 \rangle$

$\langle (1)(1), 2(2)(1)(1), 3(1)(2)(1) \rangle \rightarrow 5\langle 1,4,6 \rangle$

2. Find the maximum rate of change of $f(x, y) = x^2 + y^3$ at the point $(2, 1)$ and the direction in which is occurs.

$f'(x,y) = 2x + 3y^2$ $\quad \tan^{-1}\left(\frac{4}{3}\right) = 53$

$f'(2,1) = 4 + 3 =$ 7 @ 53°