King Fahd University of Petroleum and Minerals
Department of Mathematical Sciences
Math 201, Sections: 3, 6, 13 (061)
Quiz 3(a)

Time: 15 Minutes **Marks: _____/9**

Name: _____ Section #: _____

ID #: _____ Serial #: _____

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1. Describe level surface of $f(x, y, z) = x^2 + y^2 - z^2$ for $k = -1, 0, 1$.

2. Evaluate: $\lim\limits_{(x,y)\to(0,0)} \dfrac{e^{-\frac{1}{\sqrt{x^2+y^2}}}}{\sqrt{x^2+y^2}}$.

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Quiz 3(b)

Time: 15 Minutes **Marks: _____/9**

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1. Is $f(x,y) = \dfrac{1-x^2-y^2}{x^2+y^2}$ continuous at $(0,0)$? Give reasons.

2. Let $f(x,y) = xy\tan\dfrac{y}{x}$. Check whether or not $xf_x(x,y) + yf_y(x,y) = 2f(x,y)$.

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Quiz 3(c)

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1. Let $f(x,y) = \begin{cases} \dfrac{x^2y^2}{x^2+y^2} & (x,y) \neq (0,0) \\ 0 & (x,y) = (0,0) \end{cases}$.

   (a) Is $f_{xy}(0,0) = f_{yx}(0,0)$?

   (b) Show that $f_{xy}(x,y)$ is not continuous at $(0,0)$.

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Quiz 3(d)

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1. Find range of the function $g(x, y) = \sqrt{36 - x^2 - y^2}$.

2. Check whether or not $f(x, y) = \dfrac{4x^3 y}{2x^4 + 3y^4}$ is continuous at $(0, 0)$.