Math 195 Section 59 Practice Midterm 2

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Abstract

You will have 50 minutes to complete the midterm. You ay use books, notes, and any other print source but absolutely nothing human or electronic.

1.Find the limit if it exists or state "Does not exist" if it does not.

a)$\lim_{(x,y)\to(1,0)} \frac{xy-y}{(x-1)^2+y^2}$

b)$\lim_{(x,y)\to(0,0)} \frac{xy^4}{x^2+y^8}$

c)$\lim_{(x,y)\to(0,0)} \frac{x^5y^5}{x^2+y^8}$

d)$\lim_{(x,y)\to(0,0)} \frac{e^{xy}-1}{y}$

2. Find the first and second order partial derivatives of $f(x,y) = x^y$.

3.Find the linearization $L(x,y)$ at $(3,0)$ to the function $f(x,y) = (x+e^{4y})^{1/2}$

4. Let $z = \sin(xyw)$ $x = st^2$ $y = s^2t$ $z = t$
Find $\frac{\partial z}{\partial s}$ where $(s,t) = (0,0)$

5. Consider the function $f(x,y) = x^y$

a) Find $\nabla f(x,y)$

b)Find the unit vector $\mathbf{u}$ that maximizes $D_{\mathbf{u}}f(1,1)$.

c)Find the corresponding value of $D_{\mathbf{u}}f(1,1)$.