1. (1 point)
Evaluate the function at the specified points.
$f(x,y) = y + xy^5, (-5,2), (4,3), (2,2)$
At $(-5,2)$: ________
At $(4,3)$: ________
At $(2,2)$: ________
Answer(s) submitted:

-
-
-

(incorrect)

2. (1 point) The function

$$f(x,y) = x^2 - y^3$$

has ___ inputs and ___ outputs. Thus it is of the form

$$f : \mathbf{R}^n \to \mathbf{R}^m$$

where $n =$ ___ and $m =$ ___.
Answer(s) submitted:

-
-
-
-

(incorrect)

3. (1 point) Find the limits, if they exist, or type *DNE* for any which do not exist.

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

1) Along the x-axis: ________
2) Along the y-axis: ________
3) Along the line $y = mx$: ________
4) The limit is: ________
Answer(s) submitted:

-
-
-
-

(incorrect)

4. (1 point)
Given $f(x,y) = -\left(6x^6y + 8xy^6\right)$. Compute:
$\frac{\partial^2 f}{\partial x^2} =$ ________
$\frac{\partial^2 f}{\partial y^2} =$ ________

Answer(s) submitted:

-
-

(incorrect)

5. (1 point) Let $z = \sqrt{5x+5y}$. Then:
The rate of change in z at $(4,4)$ as we change x but hold y fixed is ________, and
The rate of change in z at $(4,4)$ as we change y but hold x fixed is ________.
Answer(s) submitted:

-
-

(incorrect)

6. (1 point) Let $f(x,y) = (2x-y)^7$. Then
$\frac{\partial^2 f}{\partial x \partial y} =$ ________
$\frac{\partial^3 f}{\partial x \partial y \partial x} =$ ________
$\frac{\partial^3 f}{\partial x^2 \partial y} =$ ________
Answer(s) submitted:

-
-
-

(incorrect)

7. (1 point) Consider the function $f(x,y) = x^2y + y^3 - 48y$.

f has [?] at $(0,0)$.
f has [?] at $(0,-4)$.
f has [?] at $(-4\sqrt{3},0)$.
f has [?] at $(4\sqrt{3},0)$.
f has [?] at $(0,4)$.

Answer(s) submitted:

-
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-
-
-

(incorrect)

8. (1 point) Find the critical points of the function $f(x,y) = x^2 + y^2 + 8x - 6y + 1$. **List your answers as points in the form** (a,b).
Answer (separate by commas): ________
Answer(s) submitted:

-

(incorrect)

9. (1 point) Find the parabola of the form $y = ax^2 + b$ which best fits the points $(1,0)$, $(4,4)$, $(5,8)$ by minimizing the sum of squares, S, given by

$$S = (a+b)^2 + (16a+b-4)^2 + (25a+b-8)^2.$$

$y =$ ________ $x^2 +$ ________

Answer(s) submitted:

-
-

(incorrect)

10. (1 point)

The function f has continuous second derivatives, and a critical point at (6, -1).

Suppose $f_{xx}(6,-1) = 16, f_{xy}(6,-1) = 8, f_{yy}(6,-1) = 4.$

Then the point (6, -1):

- A. cannot be determined
- B. is a local maximum
- C. is a saddle point
- D. is a local minimum
- E. None of the above

Answer(s) submitted:

-

(incorrect)