

Name : _____

240 - Calculus III: Test 3 Extra Credit

DIRECTIONS: Show all work! There is a total of 5 points which will be added to Test 3.

1. (5 points) Let $f(x, y)$ be defined as

$$f(x, y) = 5x^2 + xy^3$$

a) What is the directional derivative of f in the direction of the vector $\langle 5, 9 \rangle$ at the point $(2, 2, 36)$?

b) What direction vector \mathbf{u} points in the steepest direction of the surface at $(2, 2, 36)$?

c) What is the value of the steepest slope possible at $(2, 2, 36)$?