Directional Derivatives.

Fall 2015

Attendance Quizzes

October 9, 2015

Practice Quiz 6 Directional Derivatives.

Consider the function:

$$f(x, y, z) = x^3 + y^4 - xyz + 5\,z.$$

1. Find $\nabla f(1, -1, -2)$.
   Answer: Gradient: $\nabla f =< 3\,x^2 - yz, 4\,y^3 - xz, -xy + 5 >$.
   Evaluates to $< 1, -2, 6 >$.

2. Find the directional derivative $D_w(f)(1, -1, -2)$ where $w =< 2, 1, -1 >$. Is the function f increasing or decreasing along w at the point $(1, -1, -2)$?
   Answer: $\frac{-6}{\sqrt{6}} = -\sqrt{6}$. Decreasing, since the derivative is negative.