

Unit 11: Partial derivatives

Let $f(x, y) = e^{-x^2-y^2}$.

1 Compute $f_x(x, y)$ and especially $f_x(1, 1)$.

2 Compute $f_{xy}(x, y)$ and especially $f_{xy}(1, 1)$

3 Compute $f_{yx}(x, y)$ and especially $f_{yx}(1, 1)$.

And now, if you are brave.

4 Compute $f_{xyx}(x, y)$ and especially $f_{xyx}(1, 1)$.

5 You are told that the result in the previous problem is $-4/e^2$.
Can you find the value of $f_{yxx}(1, 1)$?

6 What is $f_{xyxyyy}(1, 2)$ for $f(x, y) = x^2 \sin(\sin(y)) + xy^3 e^{e^x}$?

Hint for the last one: the answer can be seen without much computation.