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 \( f(x, y) = x^2 \sin(\sin(y)) + xy^3e^{ex} \)?
   Hint for the last one: the answer can be seen without much computation.