Hand-in Homework

Work out the following problems on your own paper and hand it in during class on Friday. Show all your work!

1. Consider the function $f(x, y) = e^{-x^2 - y^2}$.

    (a) Find the tangent plane to $f(x, y)$ at the point $(1, 1, e^{-2})$. Leave your answer in the form $z = ax + by + c$.

    (b) Find a vector normal to the tangent plane by taking the cross product of two *vectors* which lie inside the tangent plane.

    (c) Find a vector normal to the surface at $(1, 1, e^{-2})$ by taking the gradient of a function of three variables. Verify that that this vector lies on the same line as the vector you found in part (b).