Homework Set 5

DUE: OCT 7, 2019 (AT THE BEGINNING OF CLASS)

To be handed in:

Please write your solution to Problem 1 on a single sheet of paper!

1. Consider the function $f(x, y) = x^4 - x^2y^2 + 3y + 8$.

   a) Compute the gradient vector field $\nabla f(x, y)$.

   b) Find a unit vector $\vec{u}$ which is *orthogonal* to $\nabla f(1, 1)$.

   c) Compute the directional derivative $\dfrac{\partial f}{\partial \vec{u}}(1, 1)$.

   Explain in words the answer you got, *justifying it* with properties of $\nabla f(x, y)$.

NOT to be handed in (but recommended for you to practice with):

2. Textbook (5th edition) Section 13.5, Exercises 1-8, 13-14, 23-25, 27, 29

3. Textbook (5th edition) Section 13.6, Exercises 1-5, 17-19, 21-25