MA 262: Review 2 **Name:**_____

This review concerns the "gradient" of a scalar field. You may wish to review this concept in a Calculus 2 book or on pages 157-162 of our text. Answer these questions on a separate sheet of paper.

(1) Let $f(x,y) = 2x^2 - xy$. What is the gradient of f?

(2) If $f(x,y) = \cos(x)\sin(y)$, in what direction from the point $(\pi/3, \pi/6)$ should you head in order to make f increase the most rapidly? (Hint: See Theorem 6.3 on page 157.)

(3) Suppose that $f\colon \mathbb{R}^2 \to \mathbb{R}$ is a differentiable scalar field. Explain how to think of ∇f as a vector field.