Preface

Here are a set of problems for my Calculus II notes. These problems do not have any solutions available on this site. These are intended mostly for instructors who might want a set of problems to assign for turning in. I try to put up both practice problems (with solutions available) and these problems at the same time so that both will be available to anyone who wishes to use them.
Vector Fields

1. Sketch the vector field for \( \mathbf{F} = -y^2 \mathbf{i} + x \mathbf{j} \).

2. Sketch the vector field for \( \mathbf{F} = \mathbf{i} + xy \mathbf{j} \).

3. Sketch the vector field for \( \mathbf{F} = 4y \mathbf{i} + (x + 2) \mathbf{j} \).

4. Compute the gradient vector field for \( f(x, y) = 6x^2 - 9y + x^3 \sqrt{y} \).

5. Compute the gradient vector field for \( f(x, y) = \sin(2x) \cos(3x) \).

6. Compute the gradient vector field for \( f(x, y, z) = z e^{xy} + y^3 \tan(4x) \).

7. Compute the gradient vector field for \( f(x, y, z) = x y^2 z^3 + 4x e^{y^2} - \ln(x - z) \).