

Name: \_\_\_\_\_

1. (5 points) Find the gradient vector field of the function

$$f(x,y) = \frac{y^2 + 2y - 1}{y^3 - 2x^2 + 5}$$

2. (5 points) A particle moves in a velocity field  $\mathbf{V}(x,y) = \langle x + y^2, 2x - y \rangle$ . If it is at position  $(5,4)$  at time  $t = 0$ , estimate its location at time  $t = 0.01$ .