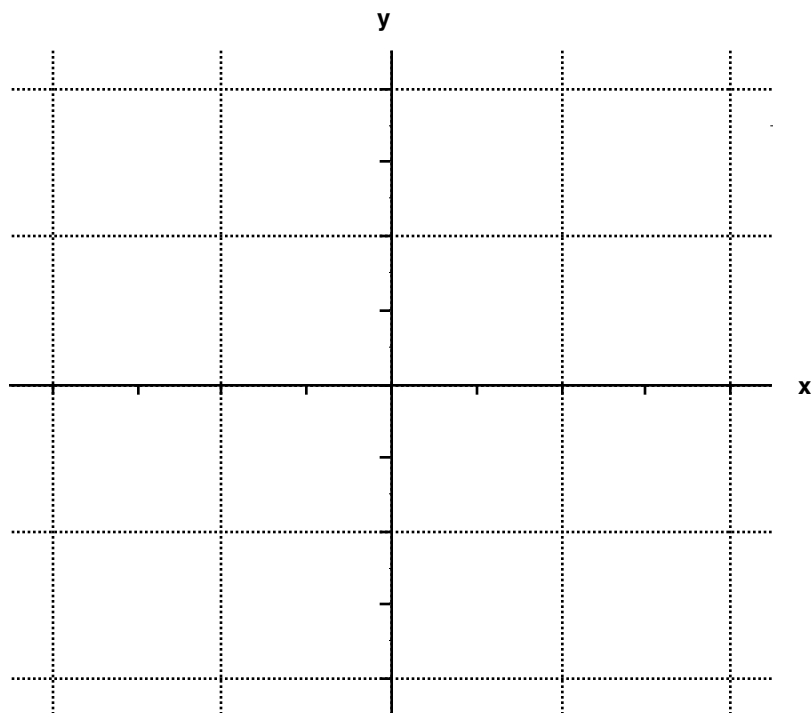


### Math 213 Class 13: Divergence and Curl Homework

1. Let  $\mathbf{F}(x,y) = y \mathbf{i}$ . Carefully sketch several representative vectors – at least one in each quadrant and at least one on each axis.

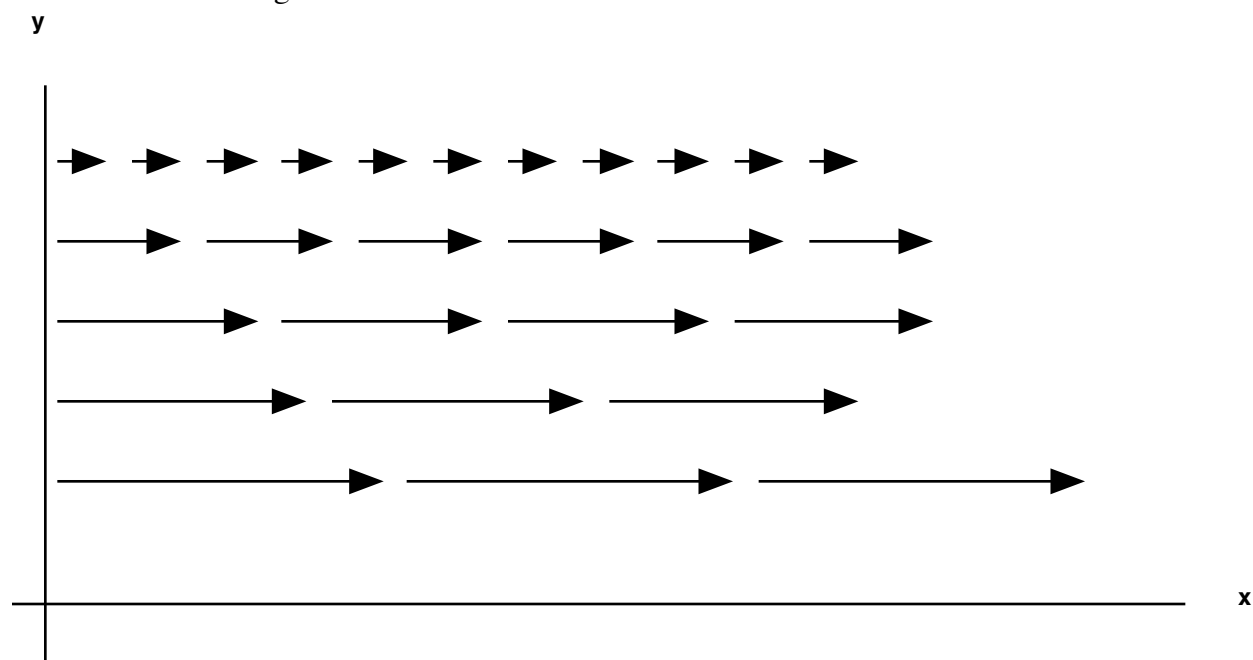


2. Let  $\mathbf{F}(x,y,z) = z^2x \mathbf{i} + y^2z \mathbf{j} - z^2y \mathbf{k}$
- a. Compute the divergence of  $\mathbf{F}$ .

- b. Compute the curl of  $\mathbf{F}$ .

### Math 213 Class 13: Divergence and Curl Homework

3. The following is an illustration of a two dimensional vector field  $\mathbf{F}$ .



- a. What can you say about the curl of  $\mathbf{F}$ ?
- b. What can you say about the divergence of  $\mathbf{F}$ ?

4. The field  $\mathbf{F}(x,y) = e^y \mathbf{i} + (xe^y + y) \mathbf{j}$  is conservative. Find the potential function of  $\mathbf{F}$ .