

**Vector Fields**  
*Scalar and Vector Fields*

**Question**

Sketch the following plane vector field and determine its field lines.

$$\underline{F}(x, y) = x\underline{i} + x\underline{j}$$

**Answer**

The field lines satisfy  $\frac{dx}{x} = \frac{dy}{x}$ ,  
i.e.,  $dy = dx$ .  
The field lines are  $y = x + C$ ,  
straight lines parallel to  $y = x$

