

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

**Question**

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

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

**Answer**

The field lines satisfy  $dx = \frac{dy}{\sin x}$ .

Thus  $\frac{dy}{dx} = \sin x$ .

The field lines are the curves

$$y = -\cos x + C$$

