

Vector Fields
Scalar and Vector Fields

Question

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

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

Answer

The field lines satisfy $\frac{dx}{x} = \frac{dy}{y}$
Thus $\ln y = \ln x + \ln C$, or $y = Cx$.
The field lines are straight half-lines
emanating from the origin

