

Vector Fields
Scalar and Vector Fields

Question

Determine the field lines of the following polar vector field.

$$\underline{F} = 2\underline{\hat{r}} + \theta\underline{\hat{\theta}}$$

Answer

The field lines satisfy $\frac{dr}{2} = r\frac{d\theta}{\theta}$, or $\frac{dr}{r} = 2\frac{d\theta}{\theta}$.

So the field lines are the spirals $r = C\theta^2$.