

Problem 3.21 Use arrows to sketch each of the following vector fields:

(a) $\mathbf{E}_1 = \hat{\mathbf{x}}x - \hat{\mathbf{y}}y,$

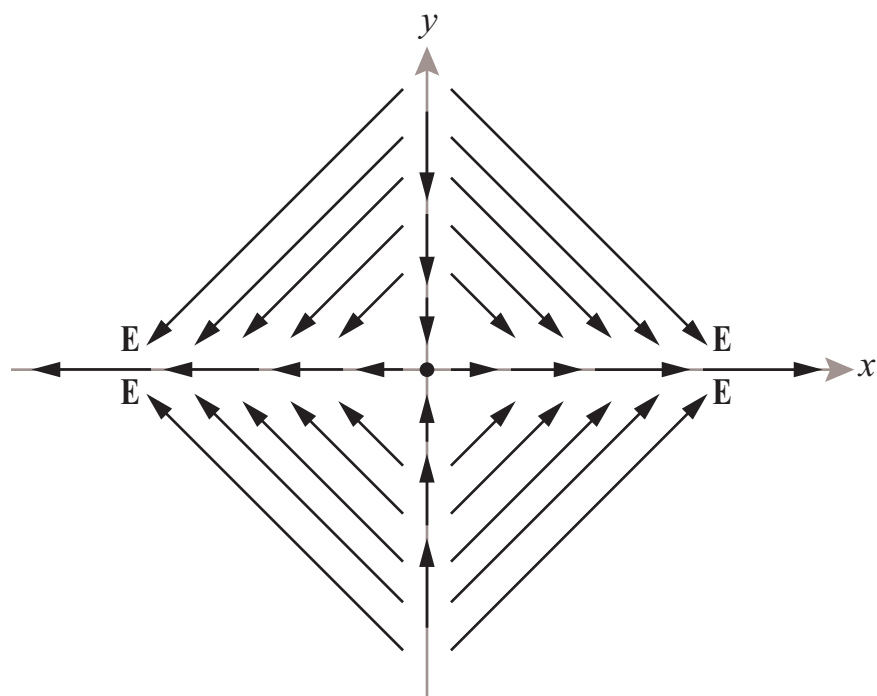
(b) $\mathbf{E}_2 = -\hat{\boldsymbol{\phi}},$

(c) $\mathbf{E}_3 = \hat{\mathbf{y}}_x^1,$

(d) $\mathbf{E}_4 = \hat{\mathbf{r}} \cos \phi.$

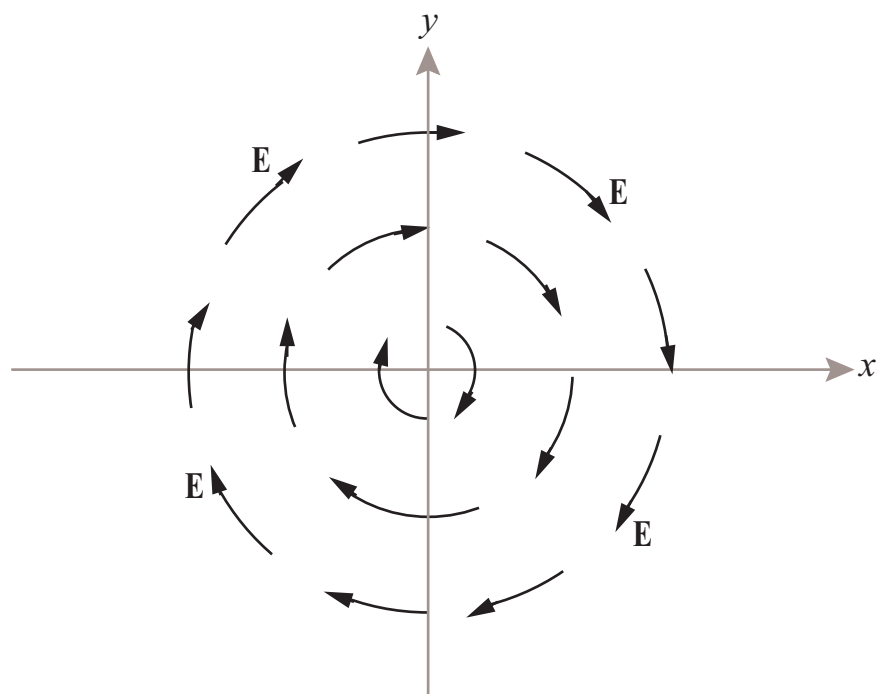
Solution:

(a)



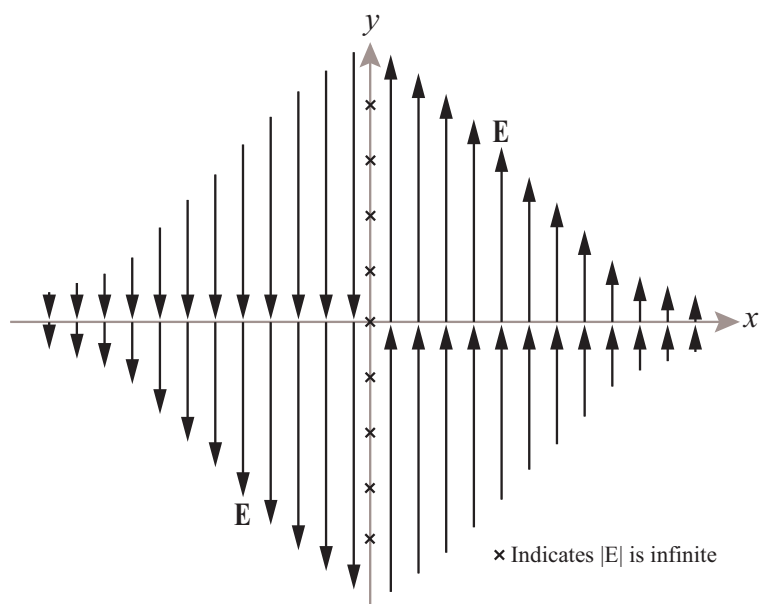
P3.21(a): $\mathbf{E}_1 = \hat{\mathbf{x}}x - \hat{\mathbf{y}}y$

(b)



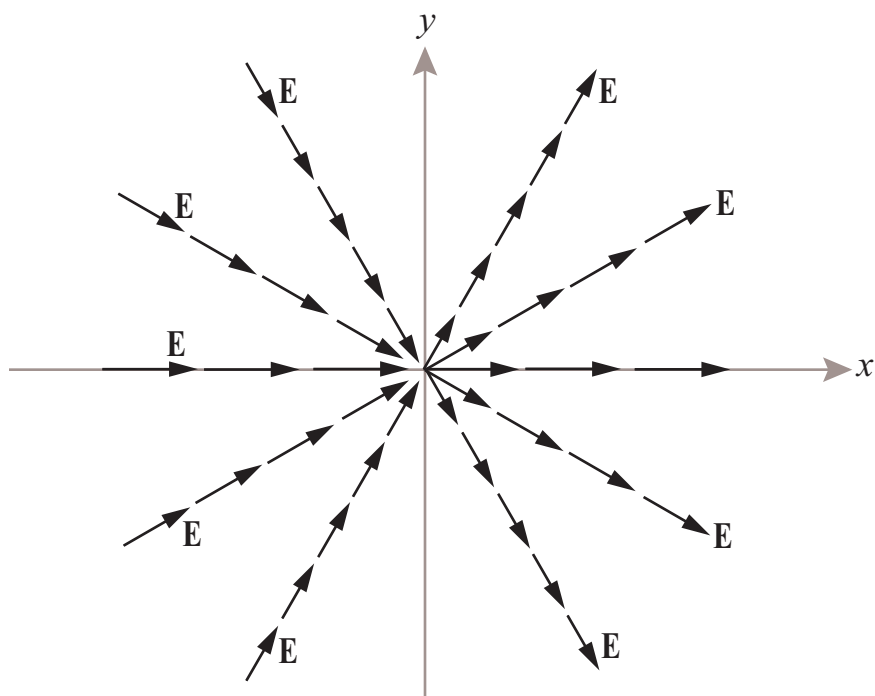
P3.21(b): $\mathbf{E}_2 = -\hat{\phi}$

(c)



P3.21(c): $\mathbf{E}_3 = \hat{\mathbf{y}}(1/x)$

(d)



P3.21(d): $\mathbf{E}_4 = \hat{\mathbf{r}} \cos \phi$
