

$$\begin{aligned}\operatorname{curl}\mathbf{F} &= \nabla \times \mathbf{F} = \begin{vmatrix} \mathbf{i} & \mathbf{j} & \mathbf{k} \\ \partial/\partial x & \partial/\partial y & \partial/\partial z \\ ye^{-x} & e^{-x} & 5z \end{vmatrix} \\ &= (0 - 0)\mathbf{i} - (0 - 0)\mathbf{j} + (-e^{-x} - e^{-x})\mathbf{k} = -2e^{-x}\mathbf{k} \neq \mathbf{0},\end{aligned}$$

so \mathbf{F} is not conservative.