Exercise 13:

a. $\nabla \cdot F = 1+1+0 = 2$, $\text{curl}_z(F) = 1-1-0 = 0$
b. $\nabla \cdot F = 0+0+0 = 0$, $\text{curl}_z(F) = 1-(-1) = 2$
c. $\nabla \cdot F = 2y+2y = 4y$, $\text{curl}_z(F) = 0-2x = -2x$
d.