

2-2)

We're given that $V(\vec{r}) = 3xy - 4x^2 + 2y$. The electric field is then

$$\begin{aligned}\vec{E}(x, y, z) &= -\frac{\partial V}{\partial x}\hat{i} - \frac{\partial V}{\partial y}\hat{j} - \frac{\partial V}{\partial z}\hat{k} = -(3y - 8x)\hat{i} - (3x + 2)\hat{j} - (0)\hat{k} \\ &= (8x - 3y)\hat{i} - (3x + 2)\hat{j}\end{aligned}$$