Potential: $V(x,y) = 150x^2 - 200y^2$ V

Electric Field: $\vec{E} = E_x\hat{i} + E_y\hat{j}$

where $E_x = -\frac{\partial V}{\partial x} = -300x$ V/m

$$E_y = -\frac{\partial V}{\partial y} = +400y \text{ V/m}$$

$\therefore$ $\vec{E}(x=2m,\ y=2m) = -600\hat{i} + 800\hat{j}$ $\frac{V}{m}$

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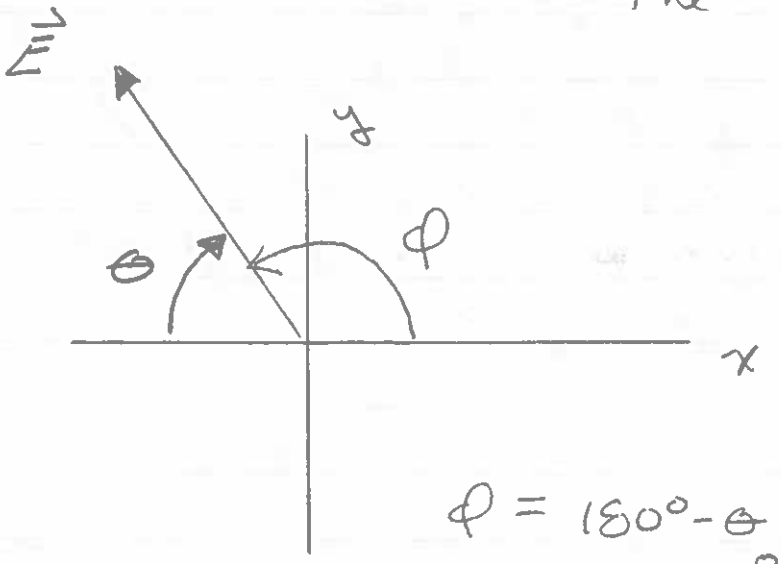
or, $|\vec{E}| = \sqrt{E_x^2 + E_y^2} = \underline{1000 \text{ V/m}}$

$\theta = \tan^{-1}\left(\frac{E_y}{|E_x|}\right) = 53.13°$ above the $-x$ axis.



$\varphi = 180° - \theta$

$= \underline{126.9°}$