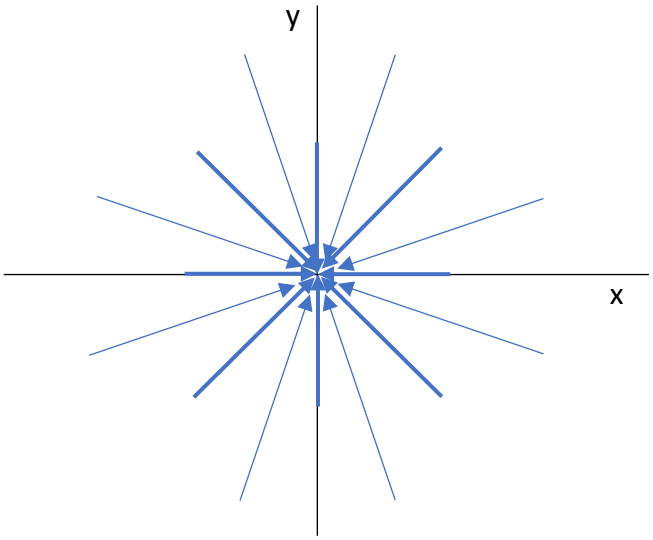
Solution 22

1) Given $E_{pot} = V(x,y) = xy \rightarrow \vec{F} = -\vec{\nabla}V = -\frac{\partial V}{\partial x}\hat{x} - \frac{\partial V}{\partial y}\hat{y} - \frac{\partial V}{\partial z}\hat{z} = -\mathrm{x}\hat{x} - \mathrm{y}\hat{y}$

2) force



3) The force is attracting towards the origin. The further from the further away from the origin the stronger the force.
It can be directly seen from the potential that the force points 'inwards': the further away from the origin the higher the potential energy. A particle will have the tendency to move down the potential energy, i.e. to lower values.
Moreover, the potential is an odd function in both x and y, reflecting the symmetry of the force around the x- and y-axis.