Write something you know about the electric field of a point charge

Solution The electric field of a point charge q:

- is a vector field;
- is proportional to the charge;
- falls off inversely like the square of the distance from the charge;
- points directly away from a positive charge or directly towards a negative charge
- has dimensions $\left[\frac{1}{Q}\frac{ML}{T^2}\right]$;
- is given by the formula:
$$\vec{E}(\vec{r}) = \frac{1}{4\pi\epsilon_0}\frac{q}{r^2}\,\hat{r}$$
- is related to the force on a test charge by $\vec{F} = q_{test}\vec{E}$;
- is related to the electrostatic potential by
$$\vec{E}(\vec{r}) = -\vec{\nabla}V(\vec{r})$$
- See these rotatable graphs for a graph of this vector field (bottom right).