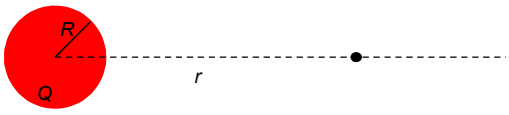
Finding Potential at $\vec{r}_f$ from Electric Field

- Select a location $\vec{r}_0$ where V is known. [i.e. $V(\infty) = 0$]
- Determine $\vec{E}$ in the region between $\vec{r}_0$ and $\vec{r}_f$. $\left[\oint \vec{E} \cdot d\vec{A} = \frac{q_{enc}}{\epsilon_0}\right]$
- Integrate to determine ΔV. $\left[\Delta V = -\int_{\vec{r}_0}^{\vec{r}_f} \vec{E} \cdot d\vec{s}\right]$
- Add to find V. $\left[V(\vec{r}_f) = V(\vec{r}_0) + \Delta V\right]$

Example: What is the potential difference between the plates of a parallel plate capacitor?

Example: What is the electric potential due to a charged spherical conductor?



Example: What is the electric potential near an infinite cylinder of charge?