Consider an infinite plane sheet perpendicular to the $x$-axis at $x = 0$. The sheet is uniformly charged with charge per unit area $\sigma$.

- Electric field (magnitude): $E = 2\pi k|\sigma| = \frac{|\sigma|}{2\varepsilon_0}$
- Direction: away from (toward) the sheet if $\sigma > 0$ ($\sigma < 0$).
- Electric field ($x$-component): $E_x = \pm 2\pi k\sigma$.
- Electric potential:
  $$V = -\int_0^x E_x dx = \mp 2\pi k\sigma x.$$  
- Here we have used $x_0 = 0$ as the reference coordinate.