

26. The potential is

$$V_P = \frac{1}{4\pi\epsilon_0} \int_{\text{rod}} \frac{dq}{R} = \frac{1}{4\pi\epsilon_0 R} \int_{\text{rod}} dq = \frac{-Q}{4\pi\epsilon_0 R} .$$

We note that the result is exactly what one would expect for a point-charge  $-Q$  at a distance  $R$ . This “coincidence” is due, in part, to the fact that  $V$  is a scalar quantity.