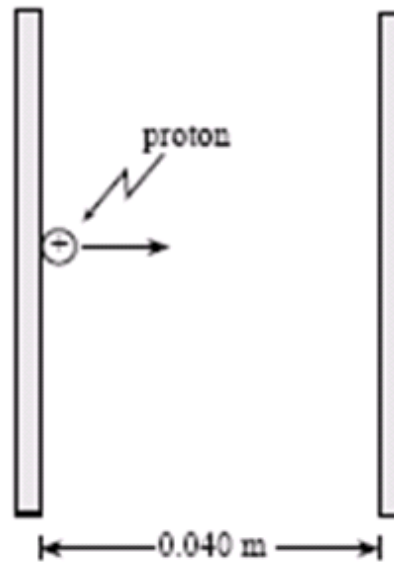
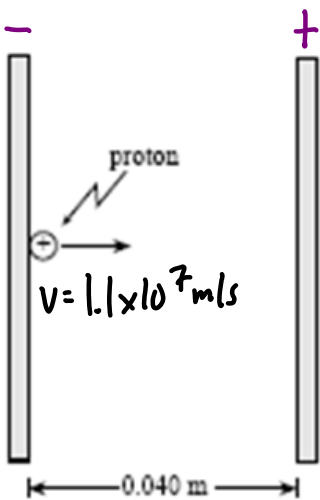


A proton leaves the left hand plate with an initial velocity of 1.1×10^7 m/s. What is the *minimum* potential difference between the plates such that the proton does not reach the right hand plate?





$$E_{ki} = \frac{1}{2} m v^2 = \frac{1}{2} (1.67 \times 10^{-27}) (1.1 \times 10^7)^2$$

$$= 1.010 \times 10^{-13} \text{ J}$$

$$\Delta E_k = E_{kf} - E_{ki} = 0 - 1.010 \times 10^{-13} \text{ J}$$

$$\Delta E_k = -1.010 \times 10^{-13} \text{ J}$$

$$\Delta E_p = -\Delta E_k$$

$$\Delta E_p = 1.010 \times 10^{-13} \text{ J}$$

$$\Delta V = \frac{\Delta E_p}{q} = \frac{1.010 \times 10^{-13} \text{ J}}{1.6 \times 10^{-19} \text{ C}}$$

$$= \boxed{+630000 \text{ V}}$$