Ex 16.1, 16.2, 16.3
7,8 12, 14, 16

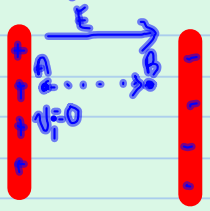
p500

$-12V = \Delta V$ $\quad \Delta V = -Ed$

$d = .3\,cm = .003\,m$ $\quad -12 = -E(.003)$

$E = ?$ $\quad E = \frac{-12}{-.003} = +4000\,\frac{V}{m}$

Ex. 16.2 p501



$E = 8 \times 10^4\,\frac{V}{m}$

$d = .5\,m$ (d between A+B)

A) $\Delta V = ?$ $\quad \Delta V = -Ed$

$= -8 \times 10^4 (.5) = -4000\,V$

B) $\frac{\Delta PE}{q} = \Delta V$ $\quad -4000\,V = \frac{\Delta PE}{1.6 \times 10^{-19}}$

$V = \frac{PE}{q}$ $\quad PE = V \cdot q$

$\Delta PE = -6.4 \times 10^{-15}\,J$

C) $\Delta PE = \Delta KE$ $\quad v_i = 0$

$PE_f^0 - PE_i = KE_f - KE_i^0$ $\quad KE = \frac{1}{2}mv^2$

$-(-6.4 \times 10^{-15}) = \frac{1}{2}mv_f^2$

$6.4 \times 10^{-15} = \frac{1}{2}(1.67 \times 10^{-27})v_f^2$

$\frac{1}{2}$ $\quad \sqrt{\frac{6.4 \times 10^{-15}}{.5(1.67 \times 10^{-27})}} = v_f$

$\frac{2}{1}$ $\quad 1.8 \times 10^6\,\frac{m}{s} = v_f$

$\Delta V = V_f - V_i$

parallel plate capacitors

electric potential difference is voltage (ΔV)

$\Delta V = -Ed$ $\quad \left(= \frac{\Delta PE}{q}\right)$

E $\quad \frac{N}{C}$ or $\frac{V}{m}$

E directed + → −