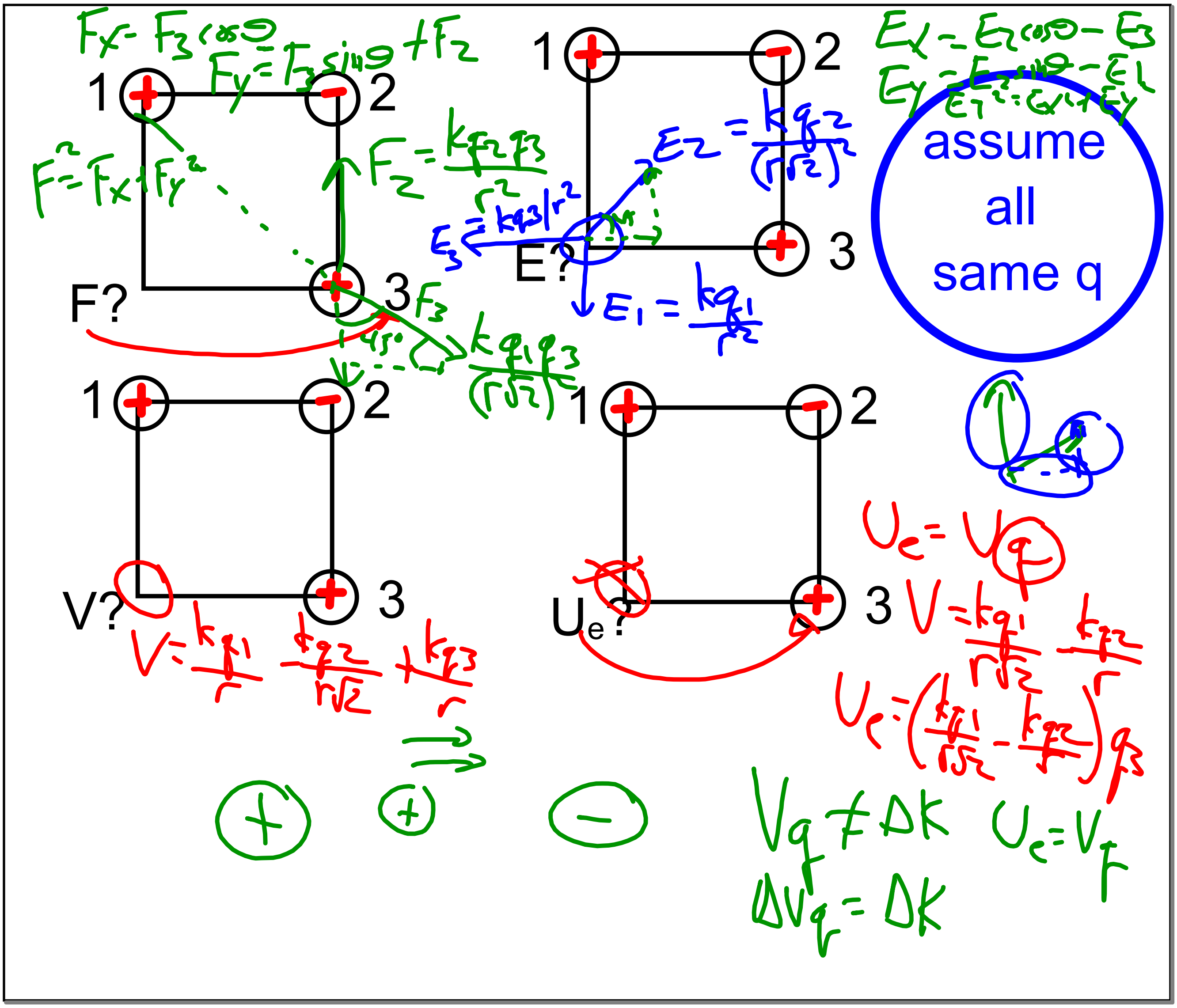
Chapter 18/19 Review

Force - F(N)	E- Field - E (N/C or V/m)	Potential - V (v or J/C)	EPE - U_e (J)
push/pull	area force is felt	energy/ charge	total energy
$F = kqq/r^2$	$E = F/q$ • $E = kq/r^2$ ‖ $E = \Delta V/\Delta d$	• $V = kq/r$ $\Delta V = V_b - V_a$ $= -W/q$	$U_e = (+)(\Delta V)q$ • $U_e = kqq/r$
vector	vector	scalar	scalar
direction determine by BOTH charges	direction defined by + test charge	can be + or -	can be + or -

• = point charges

‖ = parallel plates

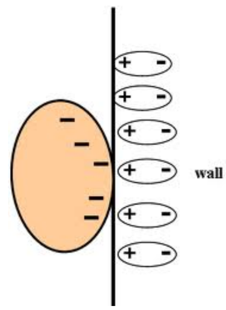

1 2 3 F?
1 2 3 E?
assume all same q
1 2 3 V?
1 2 3 Ue?

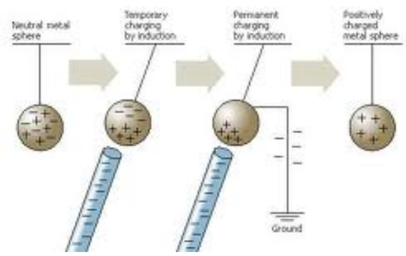
Capacitors

- $q = CV$ Farads
- $C = \kappa\varepsilon_o A/d$
- $\kappa = E_o/E$ $E < E_o$ (dielectric constant)
- adding dielectric DECREASES E field and INCREASE Capacitance
- $U_c = 1/2CV^2$

Polarization

- induced separation of charge
- causes neutral objects to attract charged objects
- causes charging only IF grounded





Conservation of energy

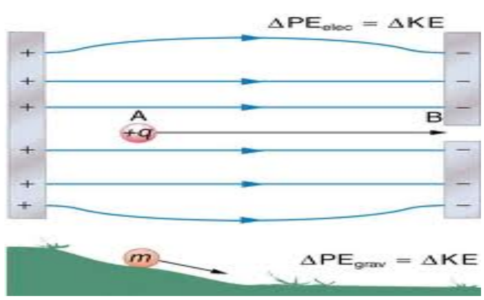
- E-field & outside Work can cause increase/ decrease in U_e and KE

$U_{ei} + KE_i + W = U_{ef} + KE_f$

normally becomes $\Delta Vq = 1/2m(v_f^2 - v_o^2)$

Remember $W = -\Delta U_e$

*****this is W done BY field and change of Ue of CHARGED particle*****



Misc. things to remember

- charge of an electron = q_e = 1.6×10^{-19} C
- 1 eV = 1.6×10^{-19} J
- $\mu = 10^{-6}$
- equipotential = perp. to E-Field