REMEMBER U_g ?

GOOD!

IT'LL HELP W/ U_E ...

CHAPTER 20

Feb 2-1:21 PM

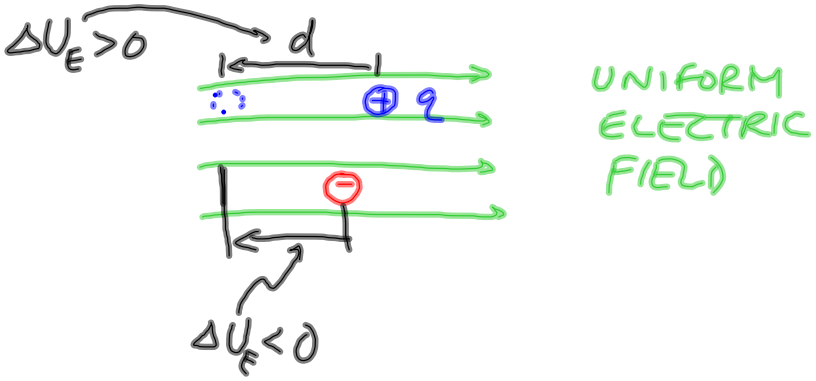
WHAT'S WORK?

$W = Fd \quad (= mgh)$ → U_g

F_E DOES WORK? YUP!

$F_E = \frac{kq_1q_2}{r^2} = qE$

$W_E = F_E d = qEd$



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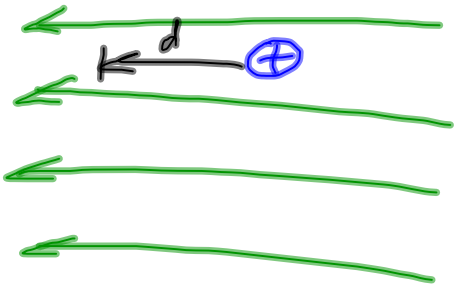

$\Delta U < 0$

$$\Delta U = qEd$$

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WHAT IS "VOLTAGE"?

$$\frac{U_g}{m} = \frac{mgh}{m}$$

$$V_g = gh$$

$$\frac{U_E}{q} = \frac{qEd}{q}$$

$$V = Ed$$

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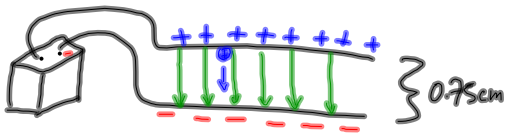
GIVEN: 12V BATTERY



$q = 6.24 \times 10^{-6} C$

FIND a. E?

b. ΔU for q

$V = Ed$

$E = \frac{V}{d} = \frac{12V}{0.0075m} = 1600 V/m \left(= N/C\right)$ (a)

$\Delta U = qEd = qV$

$= (6.24 \times 10^{-6} C)(1600 V/m)(0.0075 m)$

$= -7.5 \times 10^{-5} CV \ (= J)$

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HOW FAST IS CHARGE MOVING WHEN IT HITS PLATE?

USE CONS. OF E

BEFORE: $U_{g_i} + K_i = U_{g_f} + K_f$

NOW: $U_{E_i} + \cancel{K_i}^{0} = U_{E_f} + K_f$?

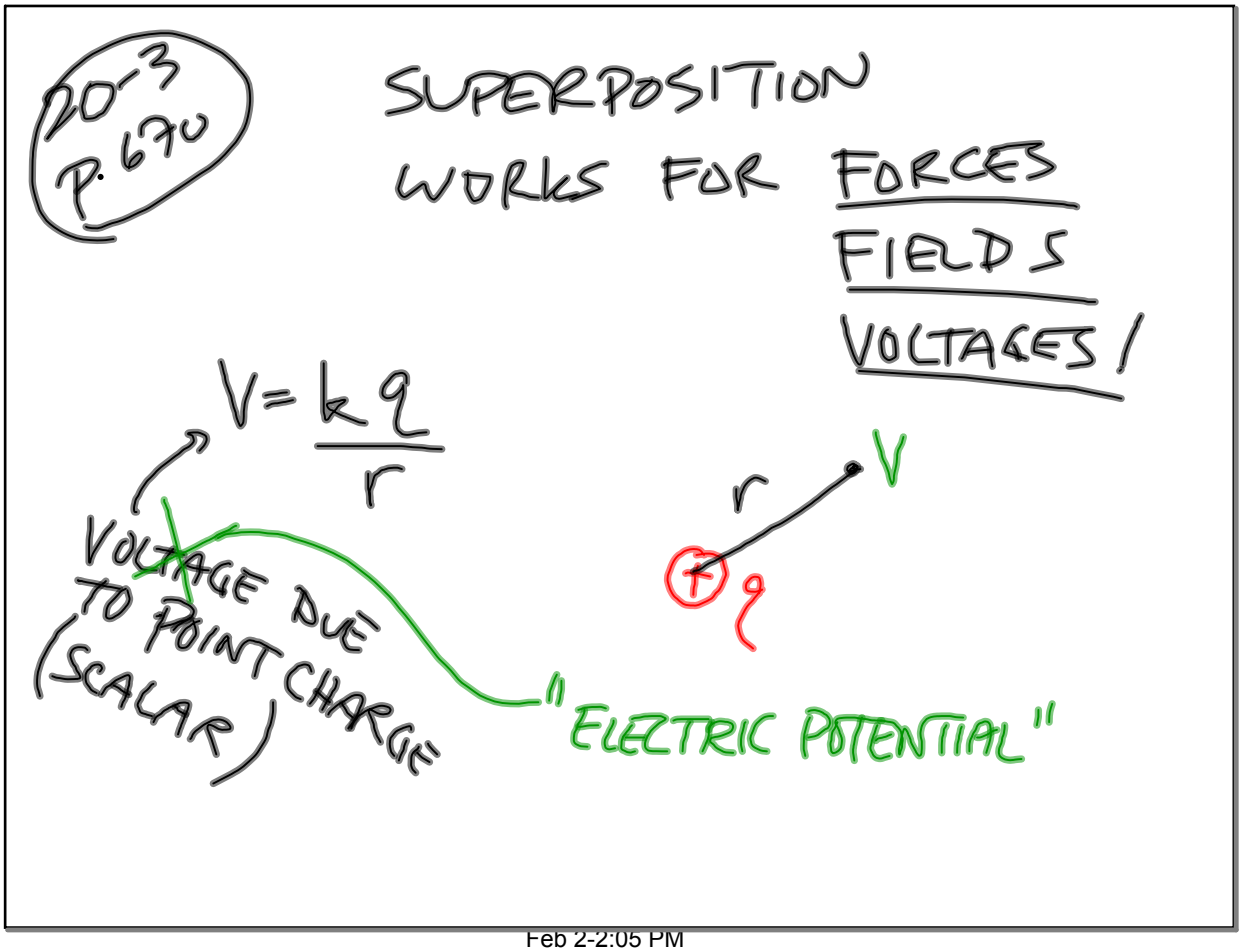
$K_f = \Delta U_E = qEd = qV$

$K_f = qV$

$\frac{1}{2}mv^2 = qV$

$v = \sqrt{\frac{2qV}{m}}$

Feb 2-2:02 PM


20-3
P. 670
SUPERPOSITION
WORKS FOR FORCES
FIELDS
VOLTAGES!
V = kq/r
VOLTAGE DUE TO POINT CHARGE (SCALAR)
"ELECTRIC POTENTIAL"
r
V
F
q

Feb 2-2:05 PM