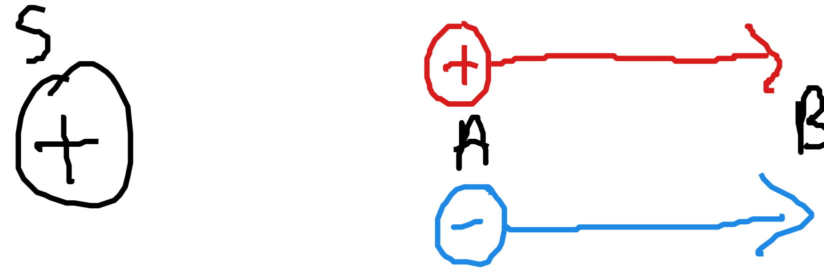


Which location is at a higher potential?

$PE = q_t V$

⊕ charge moves from A to B and loses PE (what it "wants" to do)

$\Delta PE = q_t \Delta V$

negative — positive — negative

moving to a lower potential

$\therefore V_A > V_B$

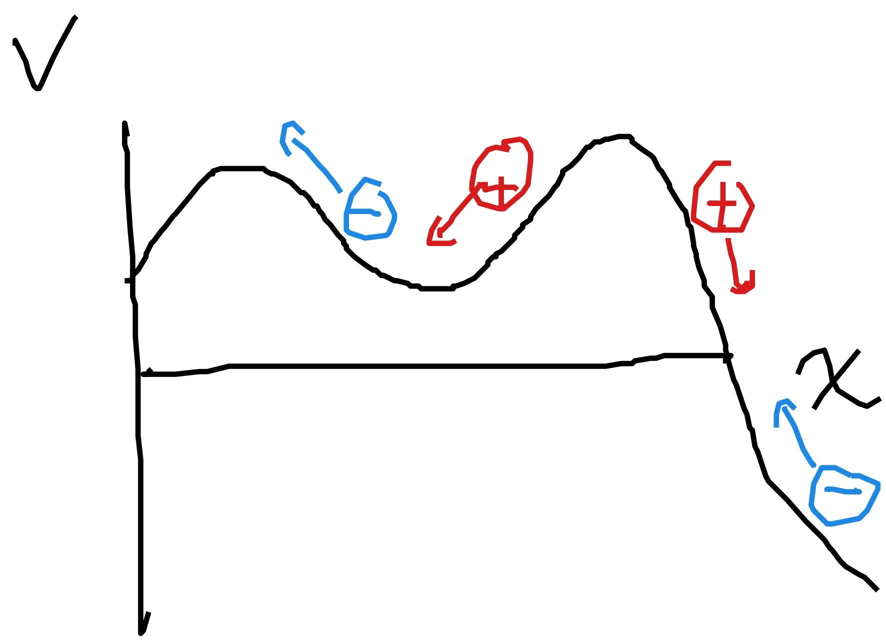
For ⊖ charge $\Delta PE = q_t \Delta V$

positive — negative — negative

Metaphor: potential as "height"

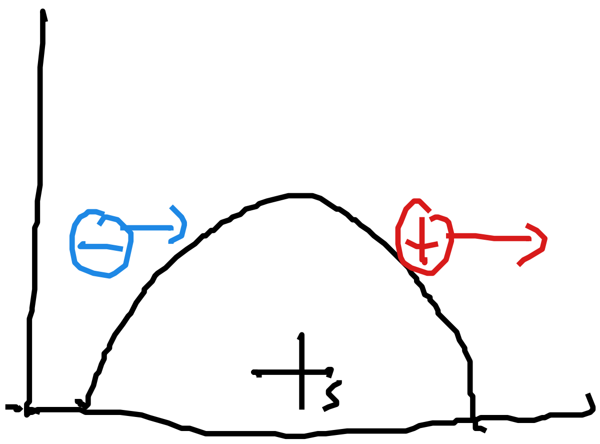
⊕ target wants to decrease PE
and so it moves to lower $\bar{V}$
(unless forced) "downhill"

⊖ target wants to decrease PE too
and so it moves to higher $\bar{V}$
and so more "uphill"

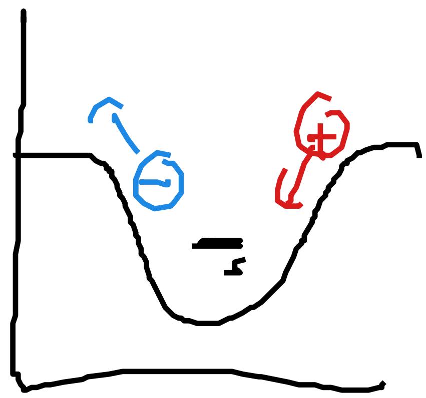


Targets move along a potential landscape

Source charges create the landscape

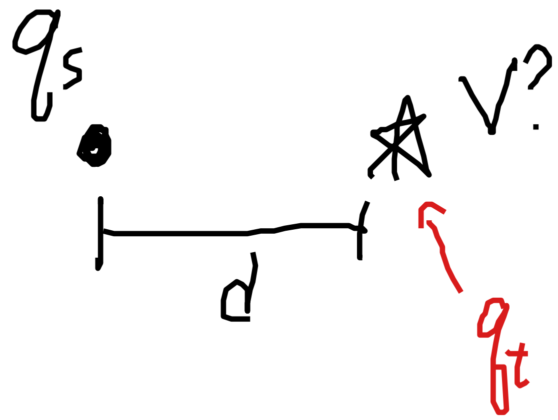


Positive sources are "peaks"



Negative sources are "pits"

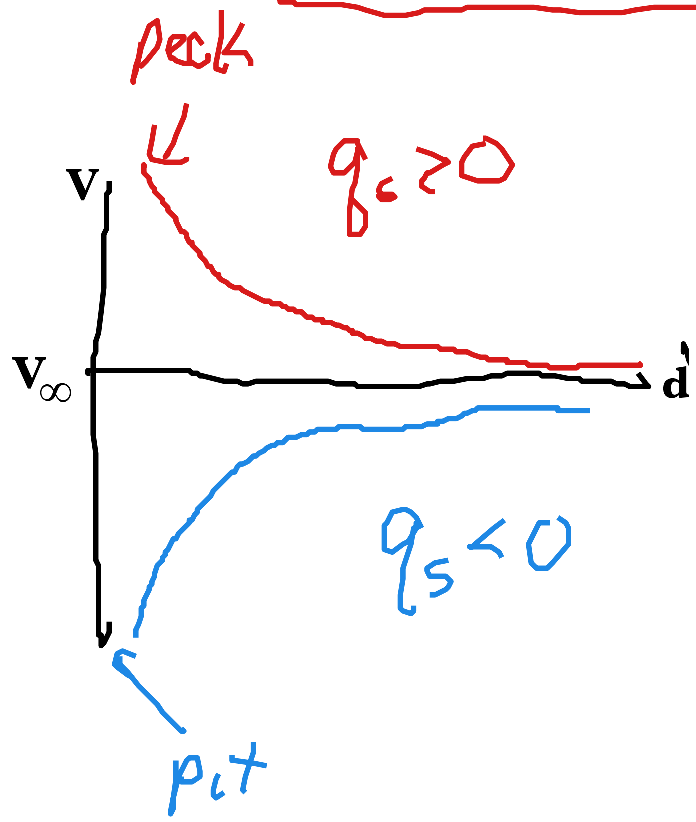
"Uphill" → "towards higher potential"



$$PE = k\frac{q_s q_t}{d} + PE_\infty$$

$$\boxed{V = \frac{PE}{q_t} = k\frac{q_s}{d} + V_\infty}$$

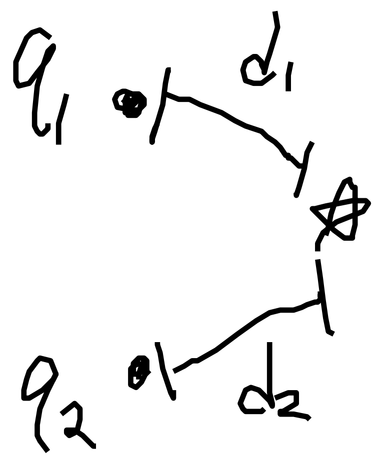
for point source charge



"see level"

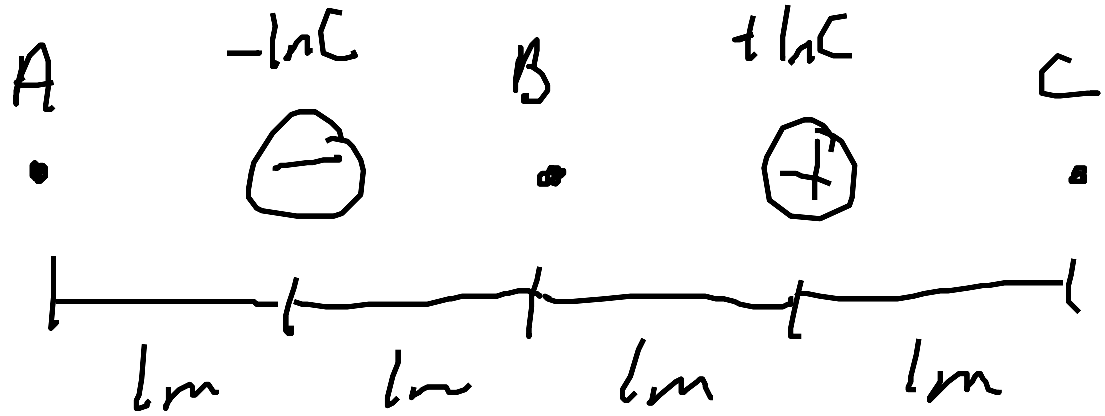
or "ground level"

For multiple sources,



$$V = k\frac{q_1}{d_1} + k\frac{q_2}{d_2} + V_\infty$$

not vectors!



Where is V highest?

$$V_A = k\frac{(-1nC)}{1m} + k\frac{(+1nC)}{3m}$$

$V_\infty = 0$

$$= (9\times10^9)\left[\frac{-10^{-9}}{1} + \frac{10^{-9}}{3}\right]$$

$$= 9\left[-1 + \frac{1}{3}\right]$$

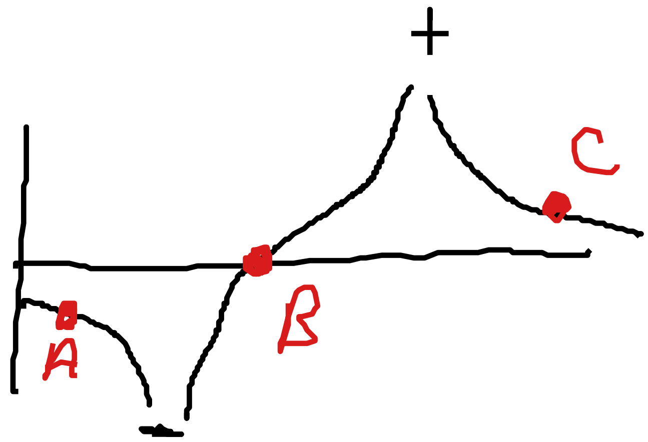
$$= 9\left[-\frac{2}{3}\right] = -6V$$

$$V_C = k\frac{(-1nC)}{3m} + k\frac{(+1nC)}{1m}$$

$$= 9\left[-\frac{1}{3} + 1\right]$$

$$= +6V$$

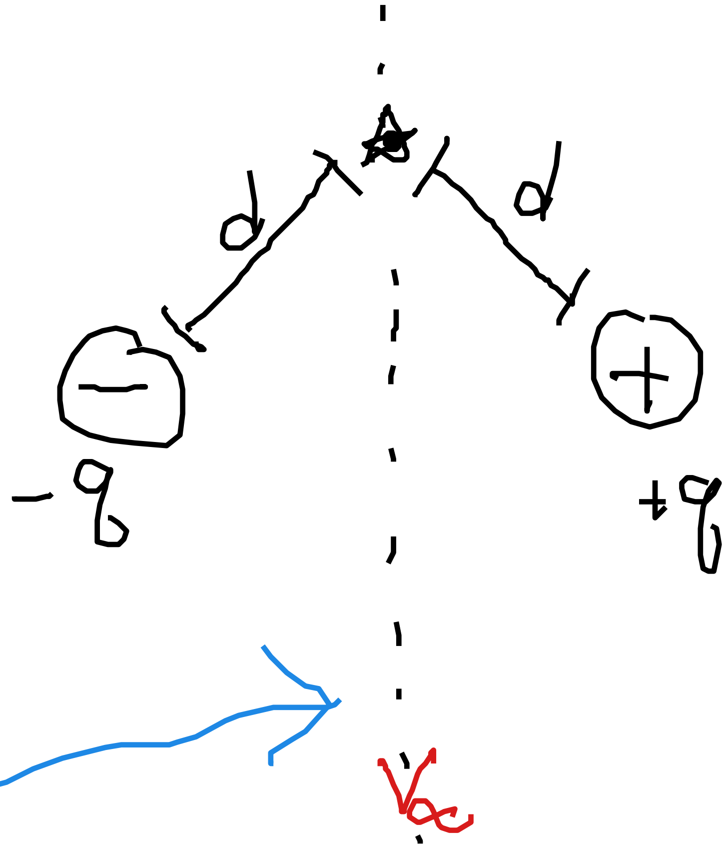
$$V_B = k\left[\frac{(-1nC)}{1m} + \frac{(1nC)}{1m}\right] = 0V$$



A	−	B	+	C
	−1nC		+1nC	
−6V		0V		+6V
0V		6V		+12V
−12V		−6V		0V

All correct depending on choice of V_n

The differences in potential are all the same.

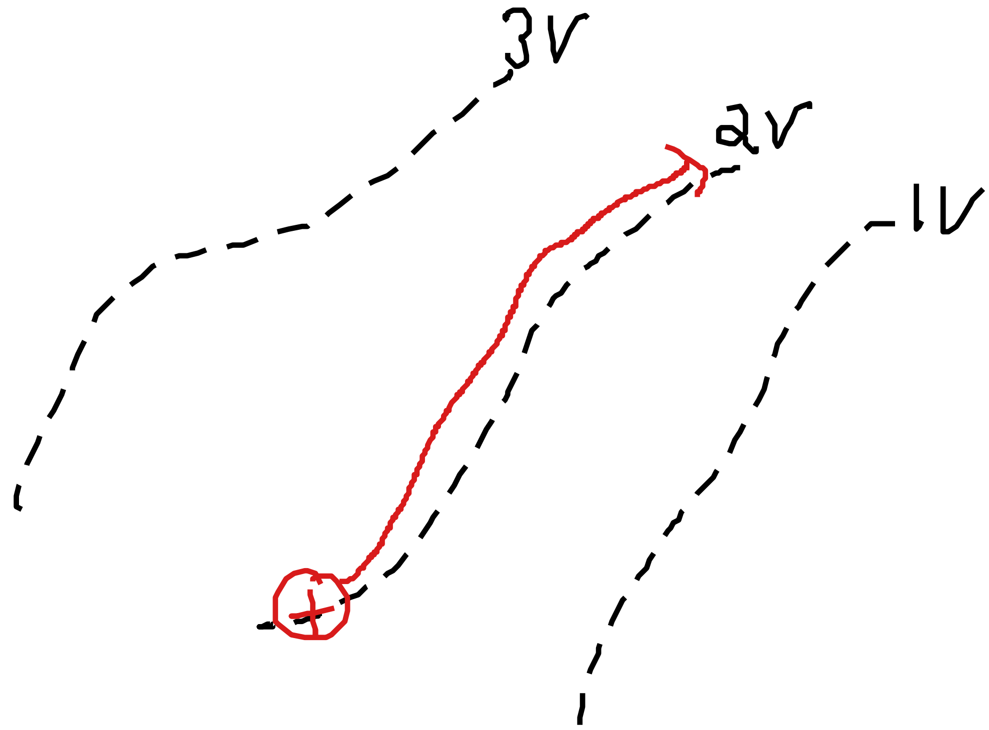


$$V_{*} = k\frac{-q}{d} + k\frac{+q}{d} + V_\infty$$

$$= V_\infty$$

Equipotential Surface
or equipotential Line

Every point on this surface
has same potential.



$$\Delta PE = q_t \Delta V = q_t (0) = 0$$

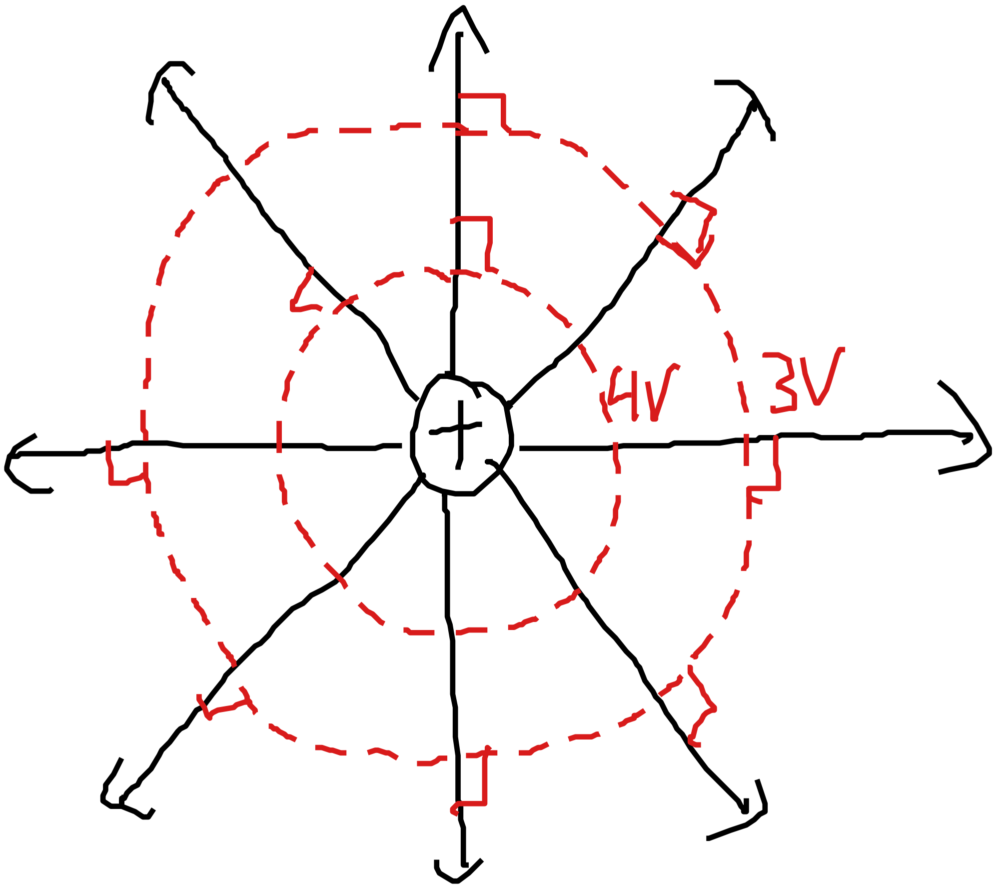
No work being done on charge

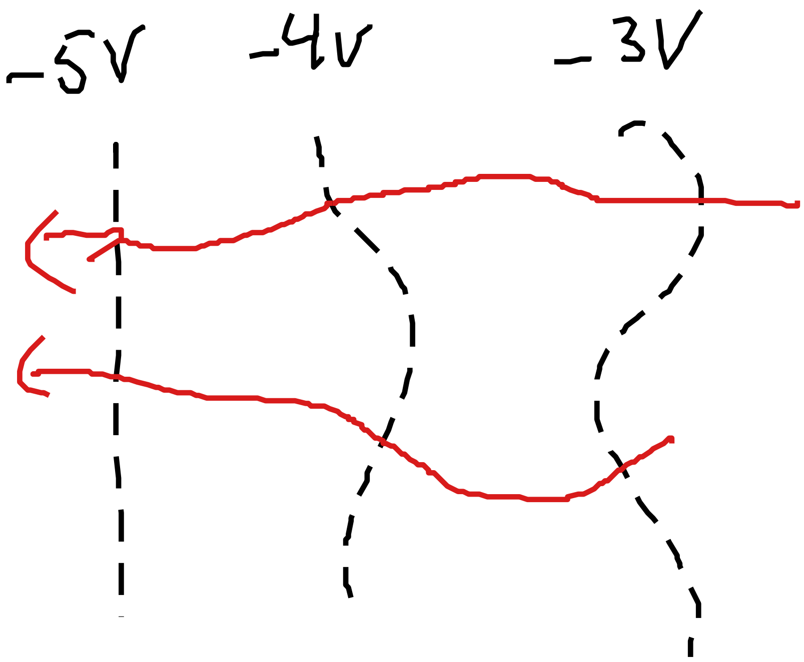
$$W = \vec{F} \cdot \Delta\vec{r} = 0$$

Force $\perp$ Motion

$\vec{F} = q_t \vec{E} \longrightarrow \vec{E} \perp$ Motion

Electric Field $\perp$ Equipotential Surfaces





Field lines point left or right?

(WWPD)

$\boxed{\text{Electric fields point downhill}}$