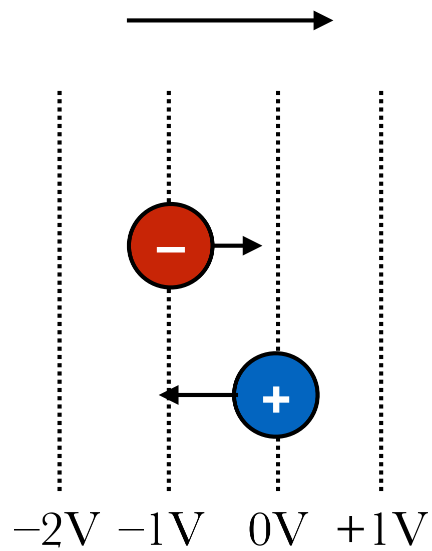
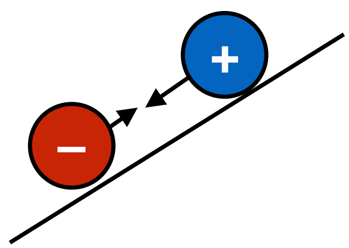
Uphill = "towards higher potential"

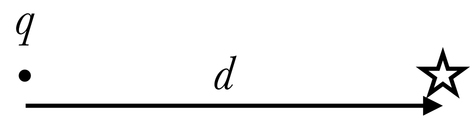


Negative target charges tend to move ***uphill****.*

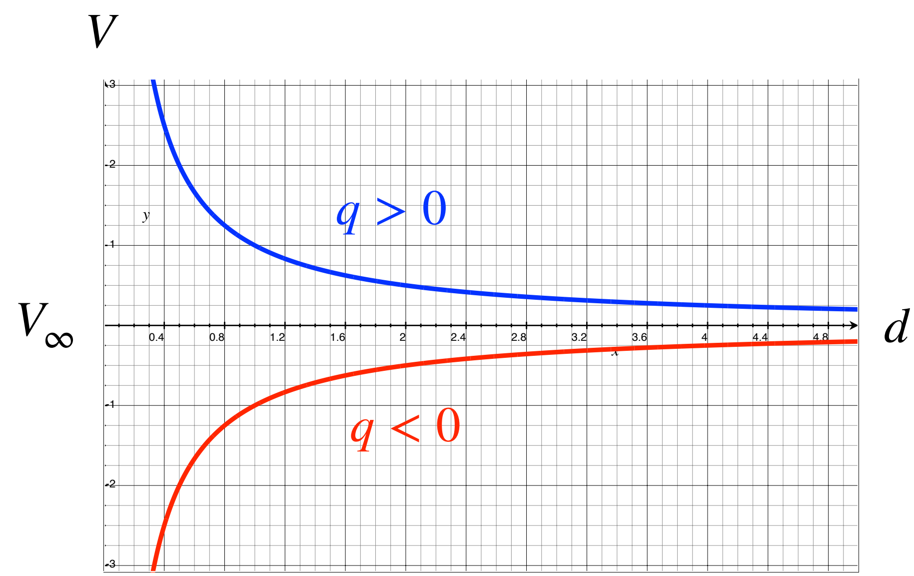
Positive target charges tend to move ***downhill****.*



Potential of a Single Point Charge

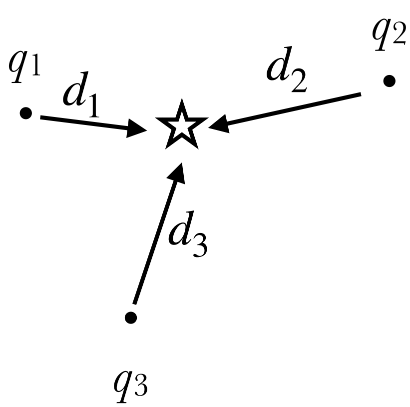


$$V = k\frac{q}{d} + V_\infty$$

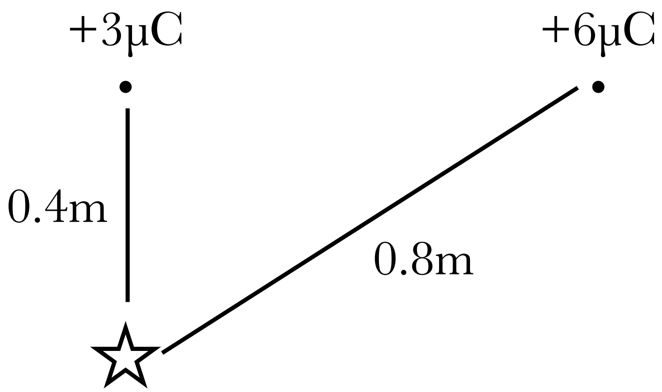


$$k = 9 \times 10^9 \frac{\mathrm{Nm}^2}{\mathrm{C}^2}$$

For this chapter, we'll assume V_∞=0.



$$V = k\frac{q_1}{d_1} + k\frac{q_2}{d_2} + k\frac{q_3}{d_3} + V_\infty$$



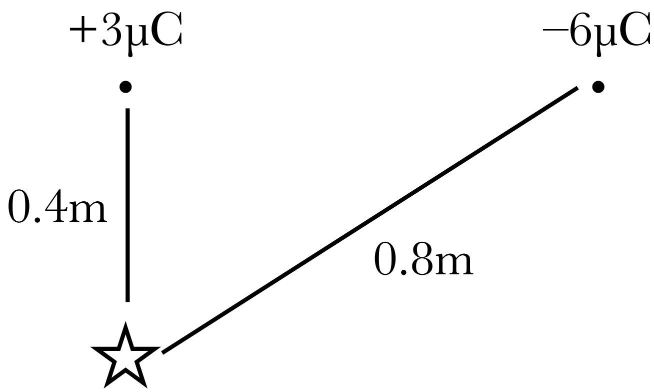
What is the potential at the star? $V_\infty = 0$

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

$$V = (9 \times 10^9)\left[\frac{3 \times 10^{-6}}{(0.4)} + \frac{6 \times 10^{-6}}{0.8}\right]$$

$$V = (9 \times 10^9)\left[7.5 \times 10^{-6} + 7.5 \times 10^{-6}\right]$$

$V = 1.35 \times 10^5$ **=135kV**



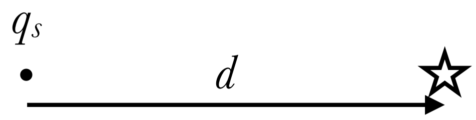
What is the potential at the star? $V_\infty = 0$

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

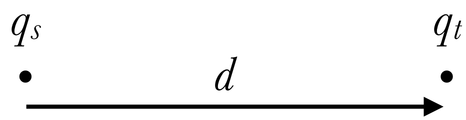
$$V = (9 \times 10^9)\left[\frac{3 \times 10^{-6}}{(0.4)} - \frac{6 \times 10^{-6}}{0.8}\right]$$

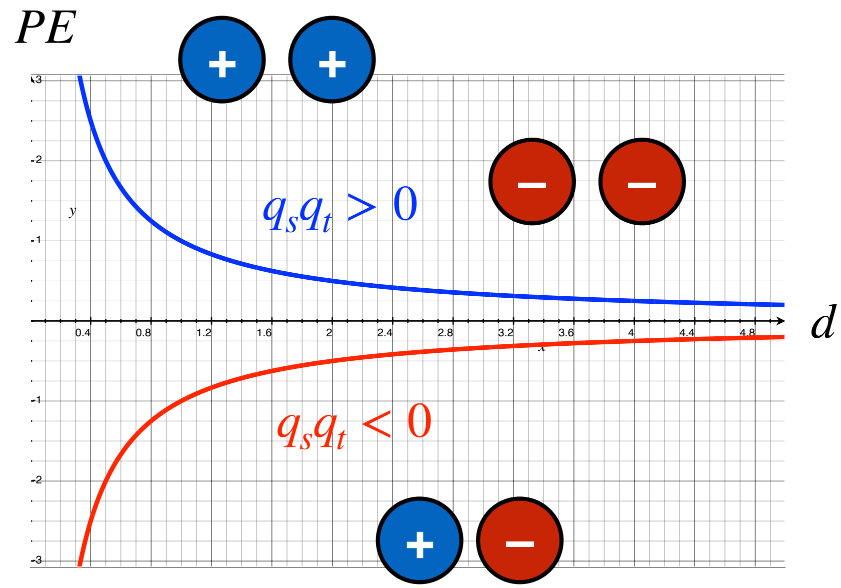
$$V = (9 \times 10^9)\left[7.5 \times 10^{-6} - 7.5 \times 10^{-6}\right]$$

$$V = 0\text{V}$$



$PE = (mg)h$

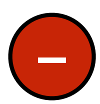


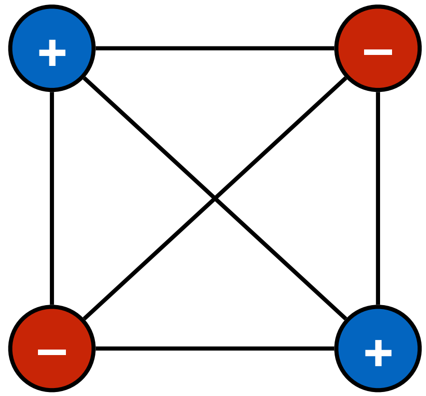


$$PE = q_t V$$

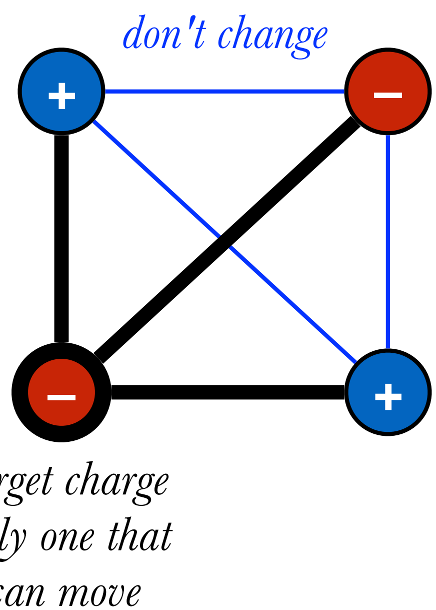
$$PE = q_t \left(k \frac{q_s}{d} \right)$$

$$PE = k \frac{q_s q_t}{d}$$ *between two point charges*





Total PE of this system
is sum of PE of each relationship



**Total PE of a target charge
is sum of PE of the relationships
involving that target charge**