

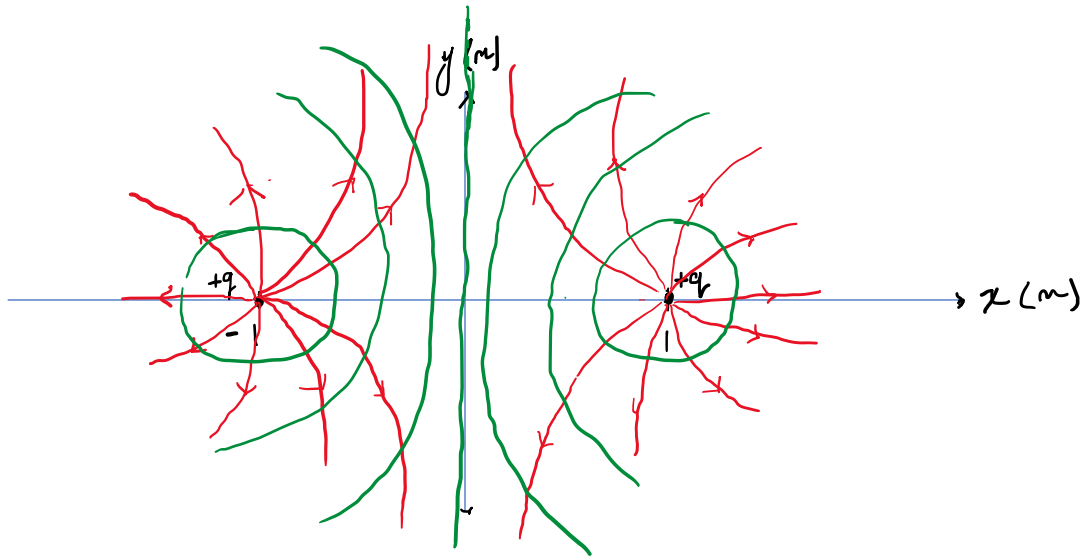
## Electric Potential Energy and Electric Potential

Draw the electric field lines and equipotential lines for the charge distribution below. Be sure to label the value of the potential for at least one equipotential line.

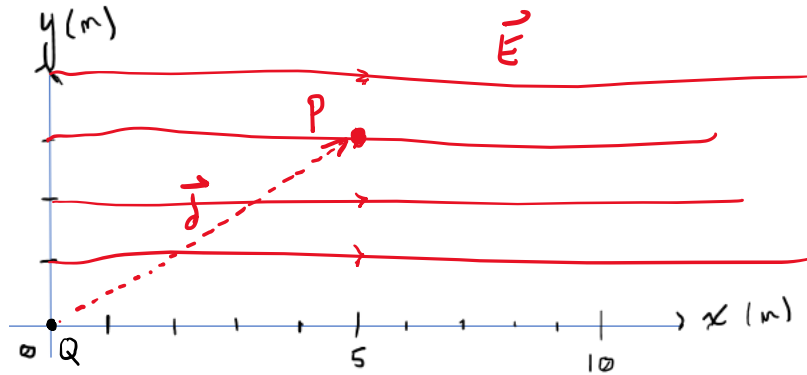
— ELECTRIC FIELD LINES

— EQUI-POTENTIAL LINES

$$V = \sum_{i=1}^2 V_i = \frac{kq}{1/1} + \frac{kq}{1/1} = \frac{2kq}{1} = \boxed{2kq}$$



How much work is done by the electric field in moving a point charge,  $Q$  from the origin to a point  $P(5,3)$ ? The electric field is  $E = 5\hat{x}$  everywhere.



$$\text{So, } \vec{E} = \langle 5, 0 \rangle ; \vec{d} = \langle 5, 3 \rangle ; q = Q.$$

$$W_E = q(E \cdot d) = Q(\langle 5, 0 \rangle \cdot \langle 5, 3 \rangle) = Q(5 \cdot 5 + 0 \cdot 3) = \boxed{25Q}$$