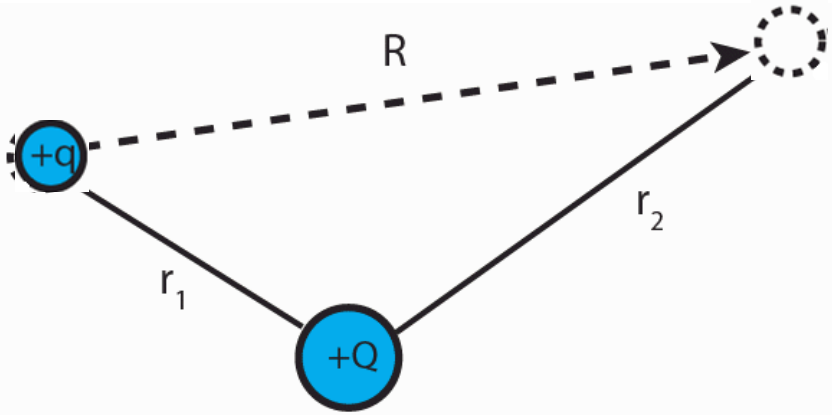
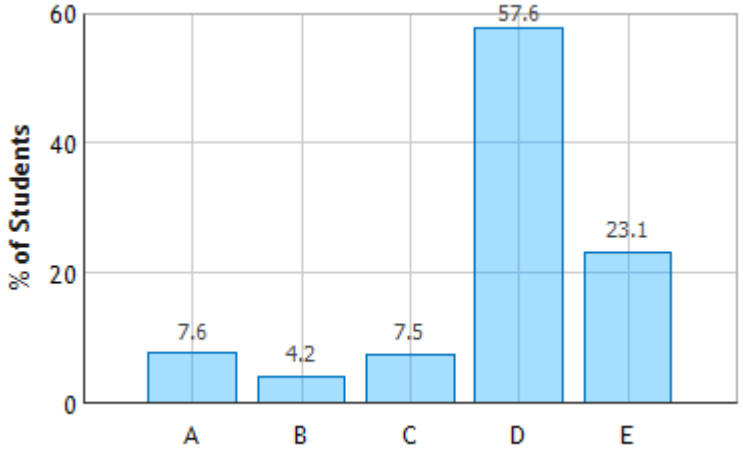
CheckPoint 1

A charge +q is moved from position 1 to position 2,
What is the change in potential energy?





A $\frac{kQq}{R}$ B $\frac{kQqR}{r_1^2}$ C $\frac{kQqR}{r_2^2}$

D $kQq\left(\frac{1}{r_2}-\frac{1}{r_1}\right)$ E $kQq\left(\frac{1}{r_1}-\frac{1}{r_2}\right)$

$$U_1 = \frac{kQq}{r_1} \qquad U_2 = \frac{kQq}{r_2}$$

$$\Delta U \equiv U_2 - U_1 = kQq\left(\frac{1}{r_2}-\frac{1}{r_1}\right)$$

The initial potential energy is represented by kQq/r1, and the final is represented by kQq/r2. The difference is then kQq(1/r2-1/r1).

Note: $+q$ moves AWAY from $+Q$.
Its Potential energy MUST DECREASE
$\Delta U < 0$