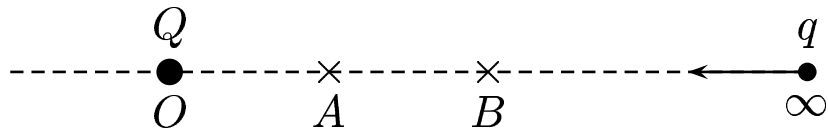


A positive point charge Q is located at O .

Given: The work in bringing another positive charge q from infinity to the point A is $W_{\infty \rightarrow A} = 1 \text{ J}$.



Find the work required in bringing the same q from infinity to the point B , where $\overline{OB} = 2a$, with $a = \overline{OA}$.

- A) $W = \frac{1}{4} \text{ J}$
- B) $W = \frac{1}{2} \text{ J}$
- C) $W = 1 \text{ J}$
- D) $W = 2 \text{ J}$
- E) $W = 4 \text{ J}$

$W_{\infty \rightarrow B} = U|_B = k \frac{Qq}{2a} = \frac{1}{2} k \frac{Qq}{a}$. Here $k \frac{Qq}{a} = 1 \text{ J}$, since it is the potential energy at A . So $W_{\infty \rightarrow B} = \frac{1}{2} \text{ J} = 0.5 \text{ J}$.

Answer **B**.