

Solutions

Each answer shows the steps, then the **result**.

2.1

- $U = k \frac{q_1 q_2}{r} = 8.99 \times 10^9 \times \frac{(3.0 \times 10^{-6})(-2.0 \times 10^{-6})}{0.40} = -0.13 \text{ J}$

2.2

- positive

2.3

- $\Delta U = -6.0 \text{ J}$

3.1 B

3.2 B

3.3

(a)

- $U = k \frac{q^2}{r} = 8.99 \times 10^9 \times \frac{(2.0 \times 10^{-6})^2}{0.30} = 0.12 \text{ J}$

(b)

- three identical pairs, so $U_{\text{total}} = 3 \times 0.12 = 0.36 \text{ J}$