Chapter 19: Electric Potential
Example Problems

\[ W = \Delta \text{EPE} \equiv \Delta U_e = q \Delta V \quad K_1 + U_1 = K_2 + U_2 \quad V = kQ/r \quad E = -\frac{\Delta V}{\Delta s} \]

Example 19.1
It takes 3.0 \( \mu \)J of work to move a 15 nC charge from point A to B. It takes –5.0 \( \mu \)J of work to move the charge from A to C. What is the potential difference \( V_B - V_C \)?

Example 19.2
(i) Sketch the situation. (ii) Determine the electric potential energy for the array of three charges in the drawing, relative to its value when the charges are infinitely far away and infinitely far apart.
**Example 19.3**

A positron (a positive electron) with an initial speed of 500,000 m/s is brought to rest by an electric field. \( m_e = 9.11 \times 10^{-31} \text{kg} \) and \( q_e = 1.60 \times 10^{-19} \text{C} \)

a. Sketch the situation. Did the positron move into a region of higher or lower potential?

b. What was the potential difference that stopped the positron?

c. What was the initial kinetic energy of the positron, in electron volts?

d. How would the potential picture change if the incoming charge was now an electron?

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**Example 19.4**

Two identical point charges \( q = 7.20 \mu \text{C} \) are fixed at diagonally opposite corners of a square with sides of length 0.480 m. A test charge \( q_0 = -2.40 \times 10^{-8} \text{C} \), with a mass of \( 6.60 \times 10^{-8} \text{kg} \), is released from rest at one of the empty corners of the square. (i) Draw a picture of the situation. (ii) Determine the speed of the test charge when it reaches the center of the square.