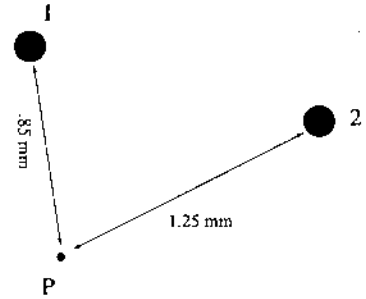
Quiz 3 – PH242 **Name**_____ ☐ **Pledged**



There are two electrons as depicted in the figure.

(A) What is the potential due to electron 1 at point P?

(B) What is the potential due to electron 2 at point P?

(C) What is the total potential at point P due to both electrons?

(D) How much work would it take to drag a third electron in from infinity to point P?

Equations

$V = \frac{k_0 q}{r}$ for a point charge $\quad \Delta W = q_0 \Delta V \quad V_{inf} = 0 \quad V_{tot} = \Sigma_i V_i$

$k_0 = 8.987 \times 10^9 \frac{Nm^2}{C^2} \quad q_{electron} = -1.602 \times 10^{-19} C \quad 1000mm = 1m$

A) $V = \frac{k_0 q}{r} = \frac{k_0 (-1.602 \times 10^{-19} C)}{(.00085\,m)} = -1.69 \times 10^{-6} V$

B) $V = \frac{k_0 (-1.602 \times 10^{-19} C)}{(.00125\,m)} = -1.15 \times 10^{-6} V$

C) $V = -2.84 \times 10^{-6} V = V_1 + V_2 = -2.84 \mu V$

D) $W_{Human} = q\Delta V = (-1.602 \times 10^{-19} C)(-2.84 \times 10^{-6} V)$

$= +4.56 \times 10^{-25} Nm$