**Special Problem 4-6.6**

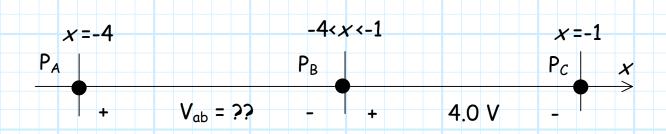There exists a **static** electric field:

$$\mathbf{E}(\bar{r}) = -\nabla\left(\frac{x^2 + y^2}{2}\right) \qquad \frac{V}{m}$$

There exists **on the x-axis** three points: $P_A$, $P_B$ and $P_C$

Point $P_A$ is located at a point where x = -4.0, and point $P_C$ is located at a point where x =-1.0, and point $P_B$ exists somewhere **between** $P_A$ and $P_C$.

The **electric potential difference** between point $P_B$ and $P_C$ is **4.0 V**.

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Determine the electric **potential difference** between $P_A$ and $P_B$.

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