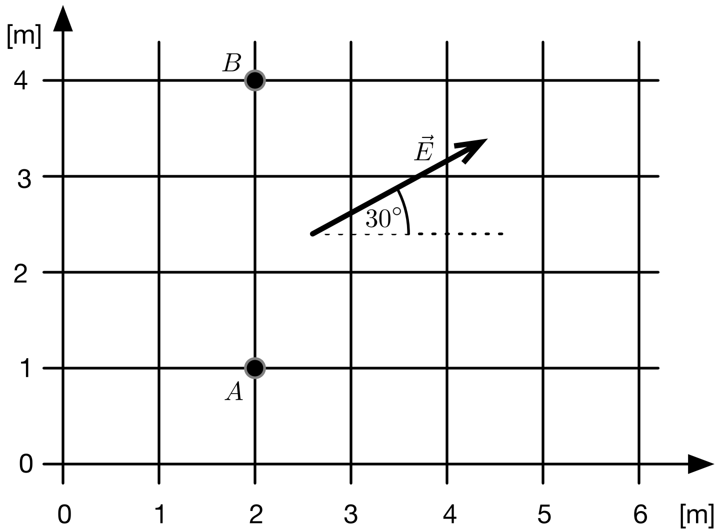
Physics 11 - Quiz 7 3/4/2020

There is a uniform electric field in the direction indicated in the diagram. The strength of the electric field is $14\frac{\mathrm{N}}{\mathrm{C}}$. As you move from point A to point B by how much does the electric potential change?



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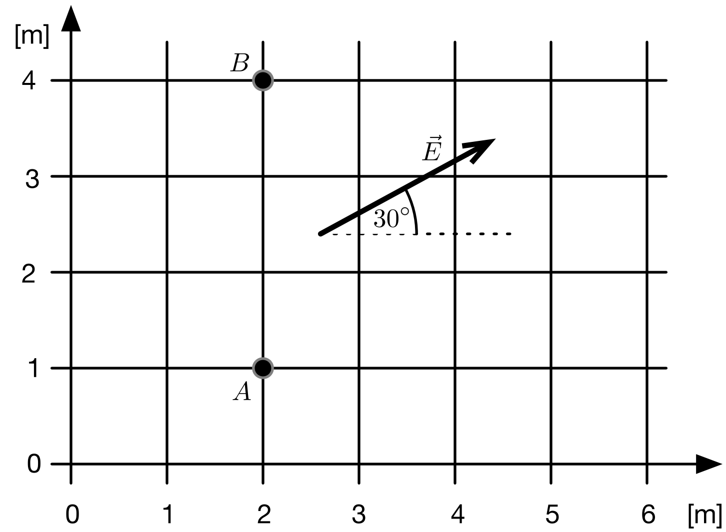

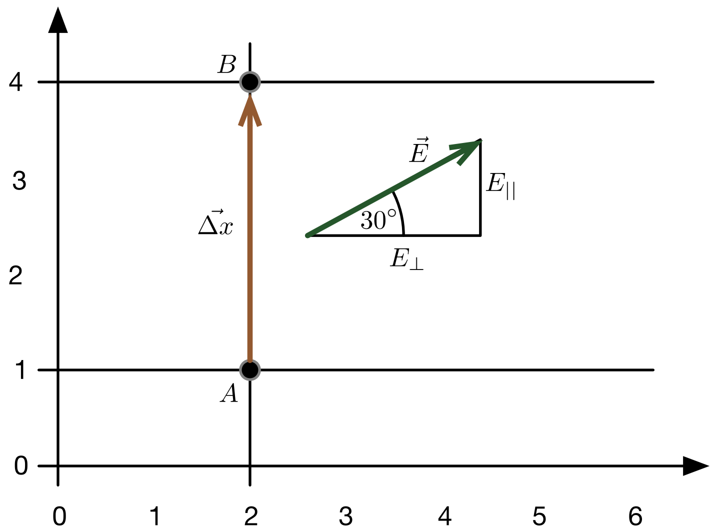

$$
\begin{aligned}
\Delta V &= -\vec{E} \cdot \vec{\Delta x} \\
&= -E_{||} \Delta x \\
&= -E \sin(30^\circ) \Delta x \\
&= -E \tfrac{1}{2} \Delta x \\
&= -(14 \tfrac{\text{N}}{\text{C}}) \tfrac{1}{2} (4\text{m} - 1\text{m}) \\
&= -21 \frac{\text{N} \cdot \text{m}}{\text{C}} \\
&= -21 \frac{\text{J}}{\text{C}} \\
&= -21\text{V}
\end{aligned}
$$