Given \( r = 1 \) m.
At \( t_1 = 0 \text{ sec}, B_1 = 1 \) T.
At \( t_2 = 2 \text{ sec}, B_2 = 2 \) T.

Find the induced emf \( E_{\text{ind}} \), in volts.

A) \( |E_{\text{ind}}| = \pi \) and its direction is clockwise.

B) \( |E_{\text{ind}}| = \frac{\pi}{2} \) and its direction is clockwise.

C) \( |E_{\text{ind}}| = \pi \) and its direction is counterclockwise.

D) \( |E_{\text{ind}}| = \frac{\pi}{2} \) and its direction is counterclockwise.
Based on the formula $\epsilon_{\text{ind}} = \left| \frac{d\phi}{dt} \right| = \left| \frac{B_2 A - B_1 A}{t_2 - t_1} \right|$, the magnitude of

induced emf $|\epsilon_{\text{ind}}| = \frac{(2 - 1) \pi}{2 - 0} = \frac{\pi}{2}$ volts.

Direction: $B_{\text{ind}}$ opposes the increase of flux within the circular loop. So $B_{\text{ind}}$ is out. RHR #3 implies that $\epsilon_{\text{ind}}$ is counterclockwise.

Answer D.

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