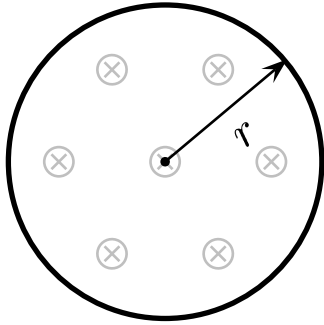


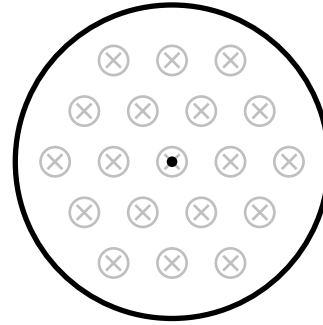
Given $r = 1$ m.

At $t_1 = 0$ sec, $B_1 = 1$ T.

At $t_2 = 2$ sec, $B_2 = 2$ T.



B_1 at t_1



B_2 at t_2

Find the induced emf \mathcal{E}_{ind} , in volts.

- A) $|\mathcal{E}_{\text{ind}}| = \pi$ and its direction is clockwise.
- B) $|\mathcal{E}_{\text{ind}}| = \frac{\pi}{2}$ and its direction is clockwise.
- C) $|\mathcal{E}_{\text{ind}}| = \pi$ and its direction is counterclockwise.
- D) $|\mathcal{E}_{\text{ind}}| = \frac{\pi}{2}$ 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_{ind} opposes the increase of flux within the circular loop. So B_{ind} is out. RHR #3 implies that ϵ_{ind} is counterclockwise.

Answer **D**.