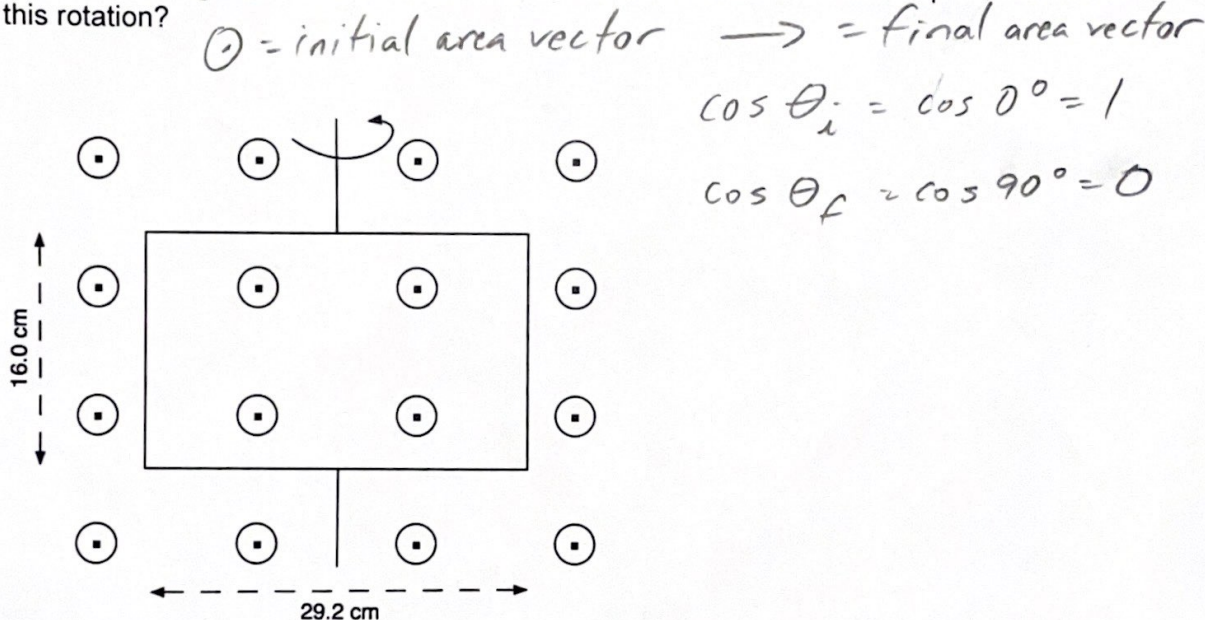


### Quiz 22.1A

The rectangular wire loop shown below is in the plane of the page, it has 475 turns, and it has a resistance of 0.0541 Ohms. The loop is immersed in a uniform external 0.882 Tesla magnetic field that points out of the page.

The loop begins to rotate around its pivot as shown, with the left side of the loop coming out of the page and the right side of the loop going into the page. The loop completes one quarter of a revolution in 0.234 seconds.

What is the magnitude and direction of the induced current in the wire loop as a result of this rotation?



$$|\mathcal{E}_{\text{ind}}| = \frac{NBA \Delta \cos \theta}{\Delta t}$$
$$= \frac{(475)(0.882)(.16)(.292)(1)}{0.234} = \boxed{83.6 \text{ Volts}}$$

$$I_{\text{ind}} = \mathcal{E}_{\text{ind}} / R = 83.647 / .0541 = \boxed{1550 \text{ Amps}}$$

$$\Phi_B \approx 0, \text{ decreasing}$$

$$\Rightarrow B_{\text{ind}} = \odot \Rightarrow \boxed{I_{\text{ind}} = \text{CCW}}$$