P. # D

Ch 20 - Worksheet

a) $A_1 = \pi r^2 = \pi \cdot (.15\,m)^2 = .0707\,m^2$

$B_1 = .086\,T$

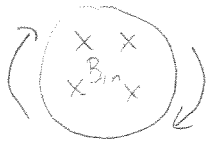
$\Phi_2 = \text{zero}\ (A = 0)$

$\Delta t = .035\ sec$

$$\mathcal{E} = \frac{\Delta \Phi}{\Delta t} = \frac{(B \cdot A_1) - 0}{\Delta t} = \frac{(.086T)(.0707m^2) - 0}{.035\ sec}$$

$\mathcal{E} = .174\,V$

- Area is decreasing, so Φ_m decreases
- $\mathcal{E}$ acts to oppose change, so $\mathcal{E}$ produces B in the same direction as existing B (B_{in})



- By RHR #2, I = Clockwise

b) $A_1 = A_2 = .0707\,m^2$

$B_1 = .086\,T$

$B_2 = .159\,T$

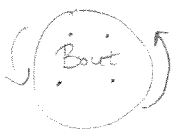
$\Delta t = .035\ sec$

$$\mathcal{E} = \frac{\Delta \Phi}{\Delta t} = \frac{(B_2 \cdot A_2) - (B_1 \cdot A_1)}{\Delta t}$$

$$\mathcal{E} = \frac{(.159T)(.0707m^2) - (.086T)(.0707m^2)}{.035\ sec}$$

$\mathcal{E} = .147\,V$

- B is increasing, so Φ_m increases
- $\mathcal{E}$ acts to oppose change, so $\mathcal{E}$ produces B that is opposite existing B (B_{out})



- By RHR #2, I = Counter-Clockwise