P. # E

Ch 20 - Worksheet

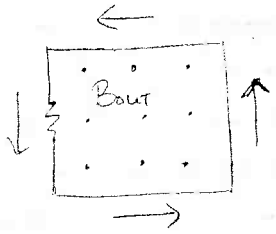
a) $F_B = .35\ N$
$B = .25\ T$
$l = 48\ cm = .48\ m$

$F_B = I \cdot l \cdot B$

$(.35\ N) = I \cdot (.48\ m)(.25\ T)$

$\boxed{I = 2.9\ A}$

- Area is increasing, so Φ_m increases
- $\mathcal{E}$ acts to oppose change, so $\mathcal{E}$ produces B against existing B, or B_{out}



- By RHR #2, $\boxed{I = \text{Counterclockwise}}$

b) $I = 2.9\ A$
$R = .50\ \Omega$

$P = I \cdot V$
$= I \cdot (IR)$
$= (2.9\ A)^2 \cdot (.50\ \Omega)$

$\boxed{P = 4.25\ W}$

c) $\mathcal{E} = V = I \cdot R = (2.9\ A)(.5\ \Omega) = 1.46\ V$

$\mathcal{E} = l \cdot v \cdot B$ so $(1.46\ V) = (.48\ m) \cdot v \cdot (.25\ T)$

$\boxed{v = 12.2\ m/s}$

d) $F = .35\ N$
$v = 12.2\ m/s$

$P = F \cdot v$
$= (.35\ N)(12.2\ m/s)$

$\boxed{P = 4.25\ W}$