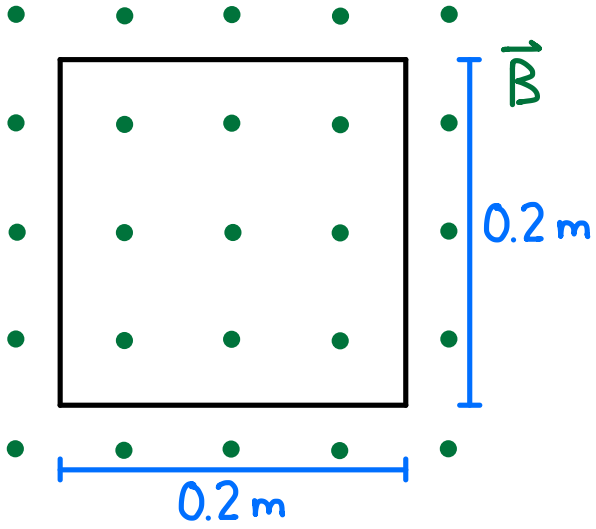
A 50-turn coil of copper wire has a resistance of 0.04 Ω/m. The coil is in a magnetic field which is increasing at a rate of 0.06 T/s.

a) Determine the magnitude of the induced emf.

b) Determine the magnitude of the induced current.

c) Determine the direction of the current.



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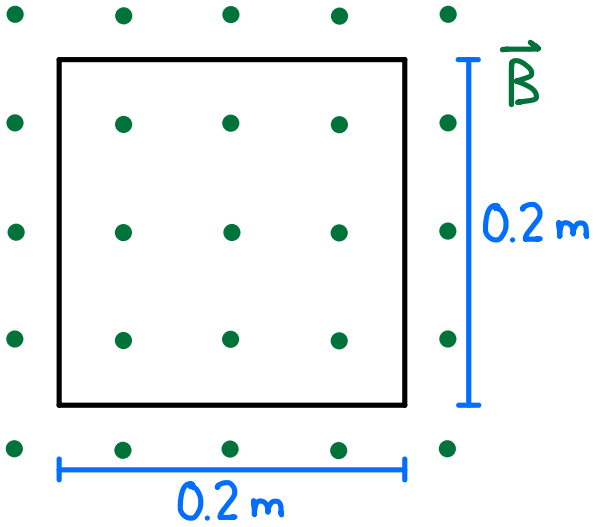

a) $\mathcal{E} = N\frac{\Delta\Phi}{\Delta t}$

$= N\frac{\Delta B}{\Delta t}A$

$= (50)(0.06)(0.2)^2$

$= \boxed{0.12\ \text{V}}$

b) $I = \frac{V}{R} = \frac{0.12}{(0.04)(50\times 4\times 0.2)}$

$= \boxed{0.075\ \text{A}}$

c) AS $B\uparrow$, $\Phi\uparrow$. BY LENZ'S LAW, I FLOWS TO $\Phi\downarrow$ BY $B\downarrow$. AS B IS OUT OF THE PAGE, B FROM I MUST BE INTO THE PAGE.

→ CLOCKWISE