Exercise 13

Chapter 7, Page 316

Introduction to Electrodynamics

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Solution ✔ Verified

Step 1 1 of 2

Just integrate the total flux over the loop:

$$\Phi = \int_S B\,dS = kt^2 \int_0^a dx \int_0^a y^3\,dy = \frac{1}{4}kt^2 a^5$$

Then just derive with respect to time to get the EMF generated in the loop:

$$\mathcal{E} = -\frac{d\Phi}{dt} = \boxed{-\frac{1}{2}kta^5}$$

Result 2 of 2

$$\boxed{\mathcal{E} = -\frac{1}{2}kta^5}$$

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