

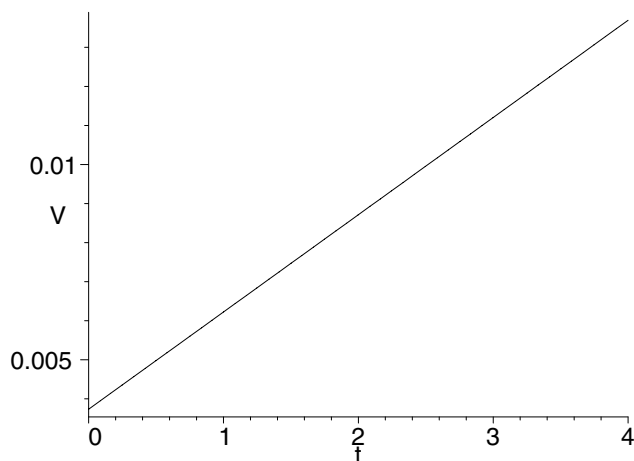
6. (a) Following Sample Problem 31-1, we have

$$\Phi_B = \mu_0 i n A \quad \text{where} \quad A = \frac{\pi d^2}{4}$$

with $i = 3t + t^2$ (SI units and 2 significant figures understood). The magnitude of the induced emf is therefore

$$\mathcal{E} = N \frac{d\Phi_B}{dt} \approx 0.0012(3 + 2t)$$

where we have used the values specified in Sample Problem 31-1 for all quantities except the current. The plot is shown below.



- (b) Using Ohm's law, the induced current is

$$i|_{t=2.0\text{ s}} = \frac{\mathcal{E}|_{t=2.0\text{ s}}}{R} = \frac{0.0087\text{ V}}{0.15\ \Omega} = 0.058\text{ A} .$$