

68. (a) The flux in coil 1 is

$$\frac{L_1 i_1}{N_1} = \frac{(25 \text{ mH})(6.0 \text{ mA})}{100} = 1.5 \text{ } \mu\text{Wb} ,$$

and the magnitude of the self-induced emf is

$$L_1 \frac{di_1}{dt} = (25 \text{ mH})(4.0 \text{ A/s}) = 100 \text{ mV} .$$

(b) In coil 2, we find

$$\Phi_{21} = \frac{M i_1}{N_2} = \frac{(3.0 \text{ mH})(6.0 \text{ mA})}{200} = 90 \text{ nWb} ,$$

$$\mathcal{E}_{21} = M \frac{di_1}{dt} = (3.0 \text{ mH})(4.0 \text{ A/s}) = 12 \text{ mV} .$$