

21. (a) We compare this expression for the current with $i = I \sin(\omega t + \phi_0)$. Setting $(\omega t + \phi) = 2500t + 0.680 = \pi/2$, we obtain $t = 3.56 \times 10^{-4}$ s.
- (b) Since $\omega = 2500 \text{ rad/s} = (LC)^{-1/2}$,

$$L = \frac{1}{\omega^2 C} = \frac{1}{(2500 \text{ rad/s})^2 (64.0 \times 10^{-6} \text{ F})} = 2.50 \times 10^{-3} \text{ H} .$$

- (c) The energy is

$$U = \frac{1}{2} L I^2 = \frac{1}{2} (2.50 \times 10^{-3} \text{ H}) (1.60 \text{ A})^2 = 3.20 \times 10^{-3} \text{ J} .$$