

Chapter 6, Solution 2.

$$\begin{aligned}w(t) &= (1/2)C(v(t))^2 \text{ or } (v(t))^2 = 2w(t)/C = (20\cos^2(377t))/(50 \times 10^{-6}) = \\&0.4 \times 10^6 \cos^2(377t) \text{ or } v(t) = \pm 632.5 \cos(377t) \text{ V. Let us assume that } v(t) = \\&632.5 \cos(377t) \text{ V, which leads to } i(t) = C(dv/dt) = 50 \times 10^{-6}(632.5)(-377 \sin(377t)) \\&= -11.923 \sin(377t) \text{ A.}\end{aligned}$$

Please note that if we had chosen the negative value for v, then i(t) would have been positive.