

30. (a) We use $I = \mathcal{E}/X_c = \omega_d C \mathcal{E}$:

$$I = \omega_d C \mathcal{E}_m = 2\pi f_d C \mathcal{E}_m = 2\pi(1.00 \times 10^3 \text{ Hz})(1.50 \times 10^{-6} \text{ F})(30.0 \text{ V}) = 0.283 \text{ A} .$$

(b) $I = 2\pi(8.00 \times 10^3 \text{ Hz})(1.50 \times 10^{-6} \text{ F})(30.0 \text{ V}) = 2.26 \text{ A}.$