## CONCEPT: ALTERNATING VOLTAGES AND CURRENTS

● BEFORE, we only considered DIRECT CURRENTS, currents that only move in _____

     - NOW we consider ALTERNATING CURRENTS, currents that move in _____

● Alternating currents are produced by ALTERNATING VOLTAGES

     - ONLY alternating voltage we will consider is $v(t) = V_{max}\cos(\omega t)$

● This alternating voltage produces an ALTERNATING CURRENT of

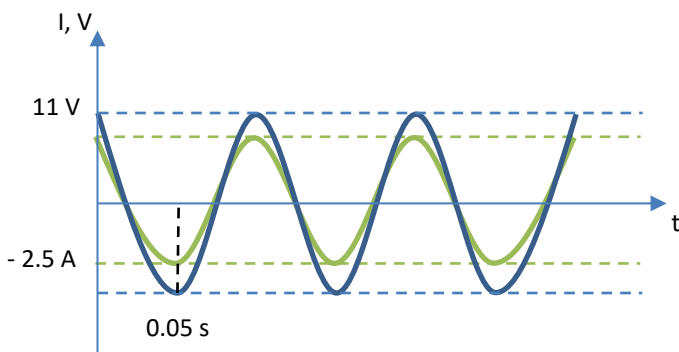   - $i(t) =$ _____   (ω is the angular frequency of alternations)
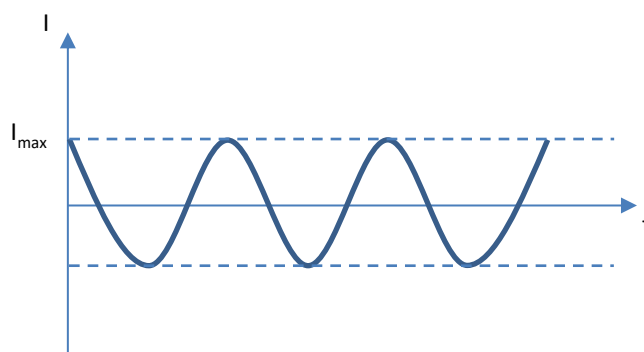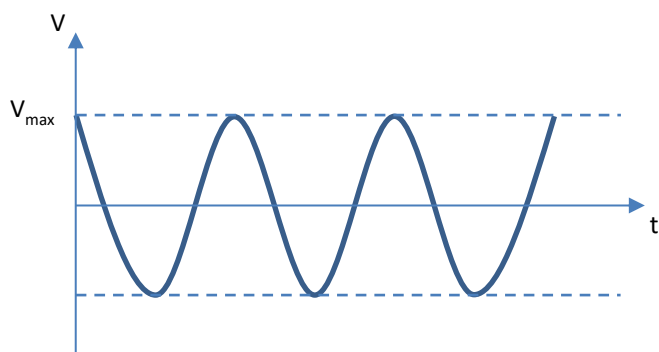
EXAMPLE: In North America, the frequency of AC voltage coming out of household outlets is 60 Hz. If the maximum voltage delivered by an outlet is 120 V, what is the voltage at 0.04 s?

PRACTICE: ALTERNATING CURRENT

An AC source produces an alternating current in a circuit with the function $i(t) = (1.5\ A)\cos[(250\ s^{-1})t]$. What is the frequency of the source? What is the maximum current in the circuit?

EXAMPLE: AC CIRCUIT GRAPHS

Current and voltage in an AC circuit are graphed in the following figure. What are the functions that describe these values?

PRACTICE: ANGULAR FREQUENCY OF ALTERNATING CURRENT

The current in an AC circuit takes 0.02 s to change direction. What is the angular frequency of the AC source?