CONCEPT: RESISTORS IN AC CIRCUITS

- Remember! In an AC circuit, the current produced by the AC source is
  - $i(t) = i_{MAX}\cos(\omega t)$
- Ohm's Law will give us the voltage across the resistor at any point in time:
  - $v_R(t) = i(t)R$

- The VOLTAGE ACROSS THE RESISTOR is
  - $\boldsymbol{v_R(t)} =$ _____

EXAMPLE: A 10 Ω resistor is plugged into an outlet with an RMS voltage of 120 V. What is the maximum current in the circuit? What about the RMS current?

- For MULTIPLE resistors in an AC circuit, you would just combine them into a single, equivalent resistor, as before.

PRACTICE: OSCILLATING VOLTAGE ACROSS A RESISTOR

The voltage across a resistor is found to be given by $v_R(t) = (10\ V)\cos[(120\ s^{-1})t]$:

a) At what frequency does the AC course operate?
b) If the resistance is 12 Ω, what is the maximum current in this circuit?
c) What is the RMS voltage of the AC source?

EXAMPLE: RESISTORS IN PARALLEL IN AN AC CIRCUIT

What is the current through the 10 Ω resistor in the following circuit?