

# Chapter 21



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## Alternating Current Circuits and Electromagnetic Waves



# AC Circuit

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- An AC circuit consists of a combination of circuit elements and an AC generator or source
- The output of an AC generator is sinusoidal and varies with time according to the following equation
  - $\Delta v = \Delta V_{\max} \sin 2\pi ft$ 
    - $\Delta v$  is the instantaneous voltage
    - $\Delta V_{\max}$  is the maximum voltage of the generator
    - $f$  is the frequency at which the voltage changes, in Hz

# Resistor in an AC Circuit

- Consider a circuit consisting of an AC source and a resistor
- The graph shows the current through and the voltage across the resistor
- The current and the voltage reach their maximum values at the same time
- The current and the voltage are said to be *in phase*

