Midterm Exam Review

Variables:

1. Voltage
2. Current
3. Resistance (conductance)
4. Power
5. Energy

Three laws:

1. Ohm's law
2. Kirchhoff's current law (KCL)
3. Kirchhoff's voltage law (KVL)

Six circuit analysis techniques:

1. KCL and KVL
2. Resistance combinations
3. Node-voltage and mesh-current methods
4. Source transformation
5. Thévenin and Norton theorem
6. Superposition

Basic equations

1. The $v - i$ and $i - v$ equations for resistors
2. Power and energy in resistors.

Basic concepts

1. Passive sign convention
2. Ideal basic circuit elements: passive elements and active elements
3. Ideal independent sources: voltage sources and current sources
4. Dependent sources:
    a. voltage controlled voltage sources
    b. voltage controlled current sources
    c. current controlled voltage sources
    d. current controlled current sources

5. Divider circuits
    a. Voltage-divider circuits
    b. Current-divider circuits
6. Open circuits
    a. Infinite resistance (no current flowing through it)
    b. No loads
    c. Switches are in "**off"** state
7. Short circuits
    a. Zero resistance (no voltage drop on it)
    b. Switches are in "**on"** state
    c. Wires
8. Maximum power transfer
9. Equivalent circuits
    a. Series-parallel connected resistors, inductors, capacitors.
    b. Series connected voltage sources
    c. Parallel connected current sources
    d. Source Transformations
    e. Thévenin equivalent circuits
    f. Norton equivalent circuits
10. Superposition principle.