Circuits

Voltage, Current, Resistance, Capacitance, Power

$V = IR$

$Q = CV$

$P = IV$

$P = \frac{V^2}{R}$

$kWh = (kW)(hr)$

V - Voltage; ***I*** - Current, C; ***R*** - Resistance, Ω; ***C*** - Capacitance, F; ***P*** - Power, W; ***E*** - Energy, J; ***kWh*** - Kilowatt-Hours

Energy and Work

$E = Pt$

$E = IVt$

$W = Vq$

E - Energy, J; ***P*** - Power, W; ***t*** - time, s; ***I*** - Current, A; ***V*** - Voltage; ***P*** - Power, W; ***W*** - Work, J; ***q*** - Charge, C;

Electric Fields

$V = Ed$

$W = qEd$

E - Electric field, N/C; ***V*** - Voltage; ; ***d*** - distance, m; ***W*** - Work, J; ***q*** - Charge, C;

Series and Parallel Circuits

Series Circuits

$R_{eq} = R_1 + R_2 + R_3 + \ldots$

- Current is the same through all resistors
- Voltage may be different across each resistor
- Individual voltages add up to the total voltage at the source

Parallel Circuits

$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \ldots$

- Voltage is the same across all resistors
- Current may be different through each resistor
- Individual currents add up to the total current at the source