PHYSICS 231 – CHAPTER 26: DC CIRCUITS

Resistors in series:

$$R_{eq} = R_1 + R_2$$

Resistors in parallel:

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

Kirchhoff's rules:

$$\sum I = 0 \ , \quad \sum V = 0$$

RC circuit:

- capacitor charging:

$$Q = C\mathcal{E}\left(1 - e^{-\frac{t}{RC}}\right) \ , \quad I = \frac{dQ}{dt} = \frac{\mathcal{E}}{R}\, e^{-\frac{t}{RC}}$$

- capacitor discharging:

$$Q = Q_0 e^{-\frac{t}{RC}} \ , \quad I = \frac{dQ}{dt} = -\frac{Q_0}{RC}\, e^{-\frac{t}{RC}}$$