

Topic

## Series and Parallel Resistive Circuits

Governing Equations and AssumptionsParallel

$$R_{eq} = \left( \sum \frac{1}{R} \right)^{-1}$$

$$R_{eq} = \frac{R_1 R_2}{R_1 + R_2} \quad (\text{Two Resistors})$$

Series

$$R_{eq} = \sum R$$

KVL, KCL,  $v = iR$ Process

- ① Label all currents and voltages
- ② Determine if there are series and parallel combinations, and convert to an equivalent circuit  
 $\Rightarrow$  One source, one equivalent resistance
- ③ Solve for the voltage or current in the equivalent circuit  
 $\Rightarrow v = iR$
- ④ Return to the original circuit and solve for the currents, voltages, and power  
 $\Rightarrow$  KVL, KCL