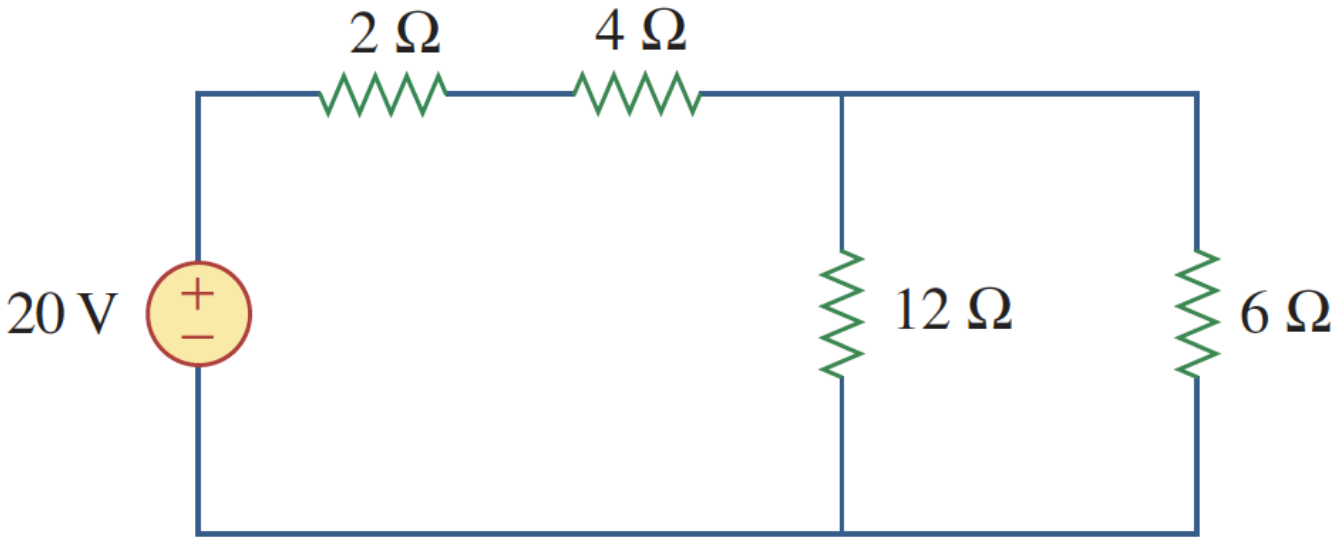
Lecture 4
Basics – 4 of 7

series/parallel resistance;
voltage/current division

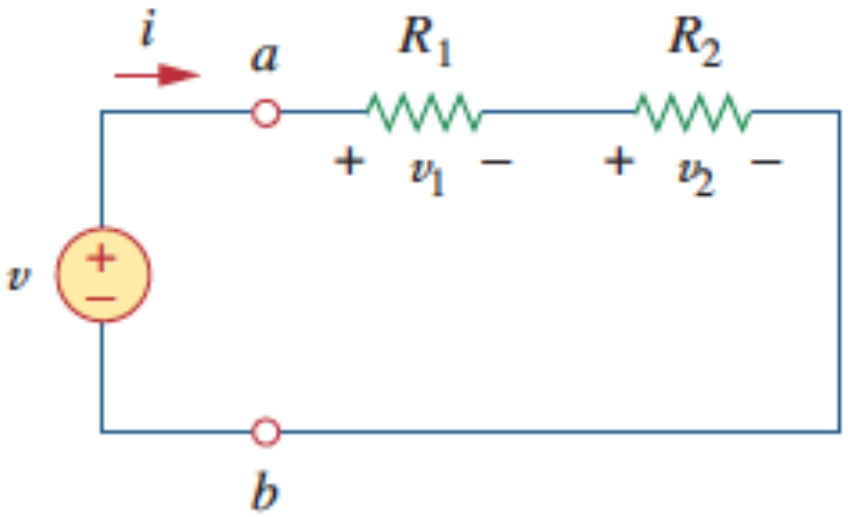
Applying KCL and KVL

Consider:

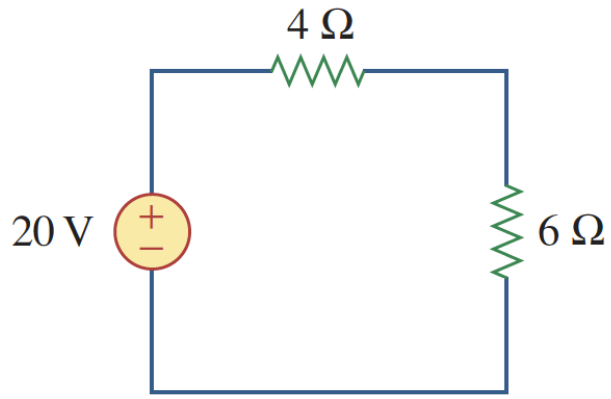
- Currents in the 2 and 4 Ω resistors (KCL)
- Voltages across the 6 and 12 Ω resistors (KVL)

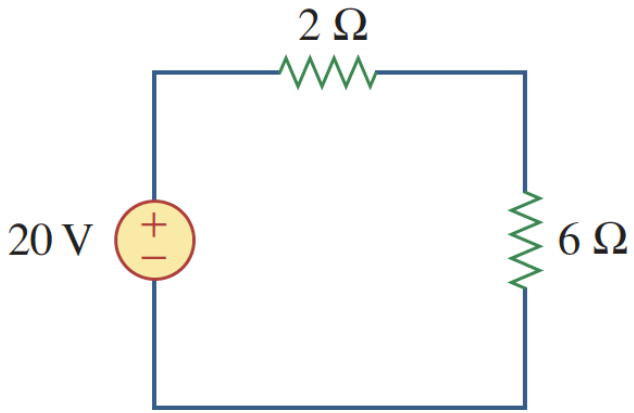


Series Resistors & Voltage Division

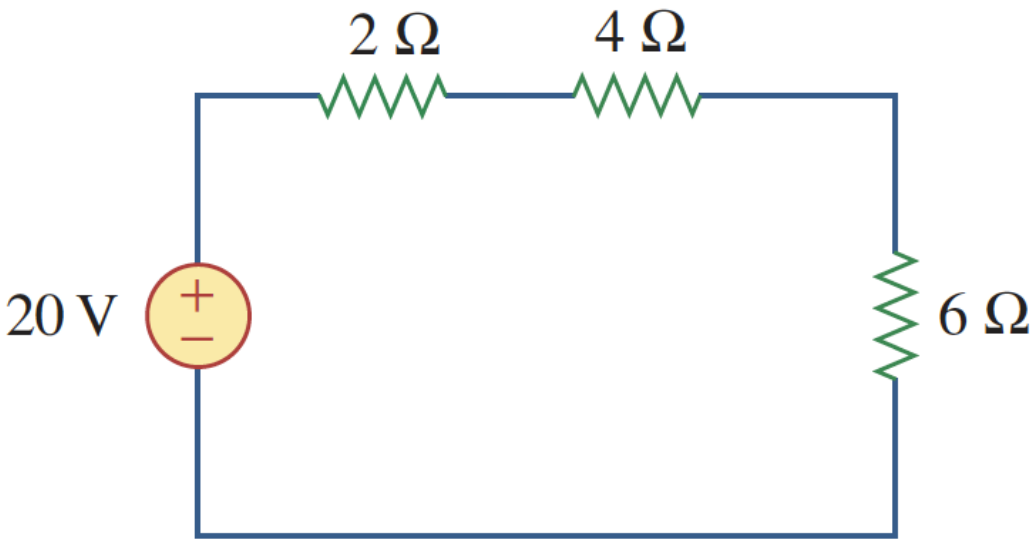


Examples

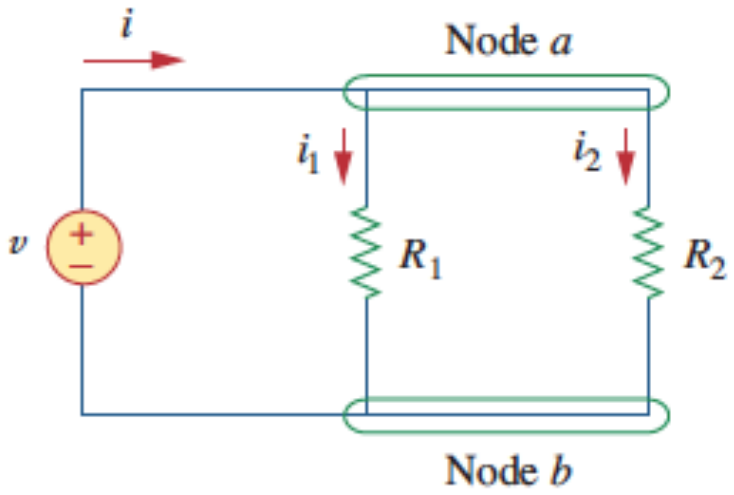




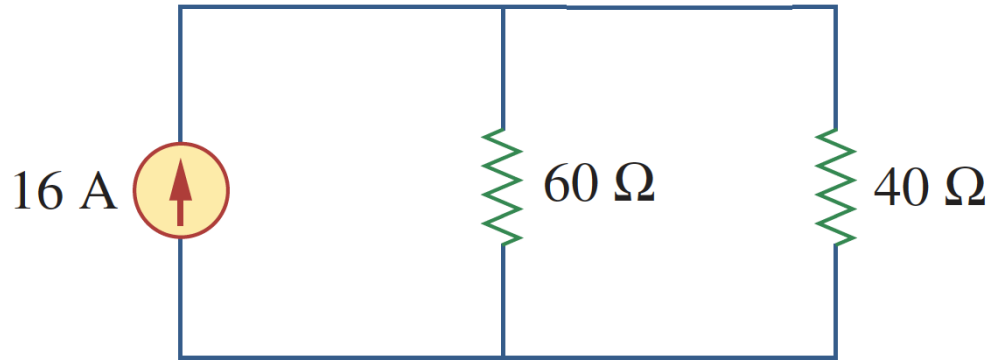
Example:

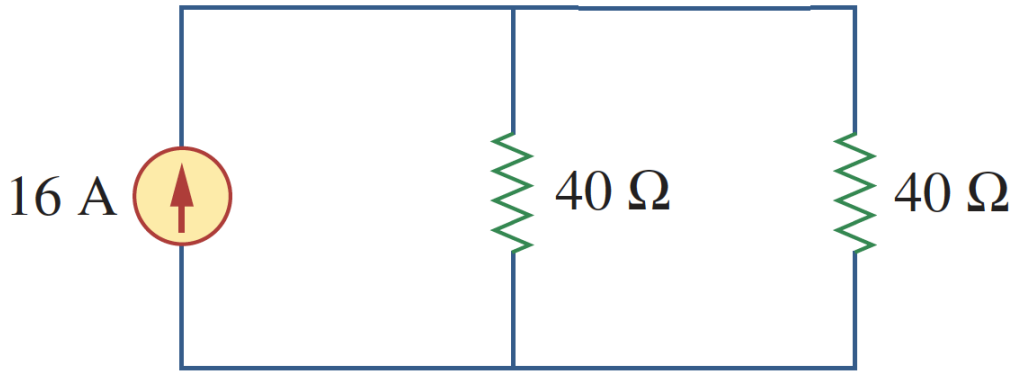


Parallel Resistors & Current Division

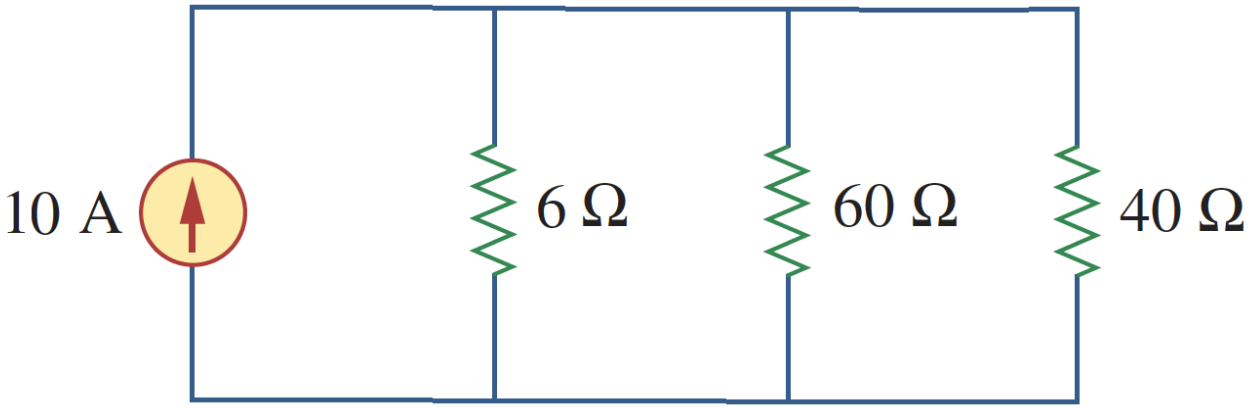


Examples:



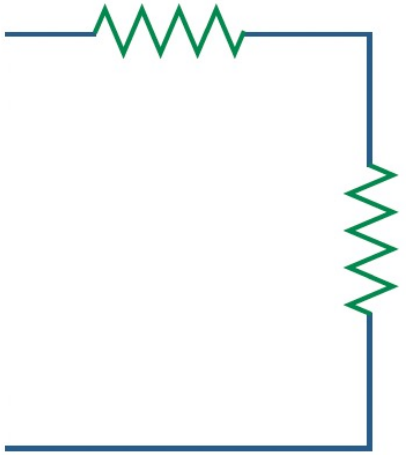


Example:

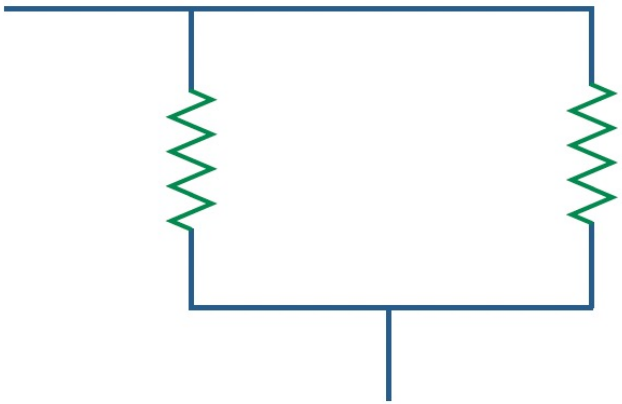


Series/Parallel Summary

- Series: resistances add
  - Nothing connected in the middle
  - **Same current (KCL)**
  - Voltage divides proportionally

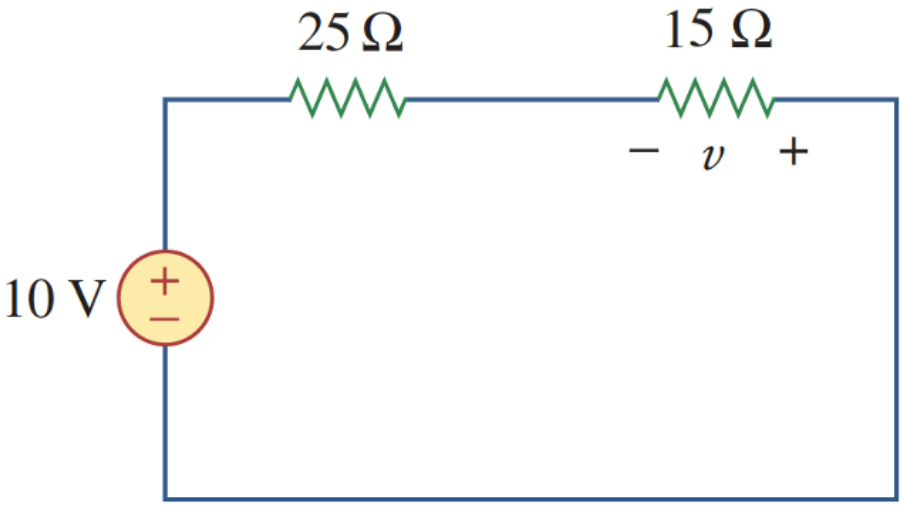


- Parallel: resistances add inversely
  - Connected at both ends
  - **Same voltage (KVL)**
  - Current divides proportionally



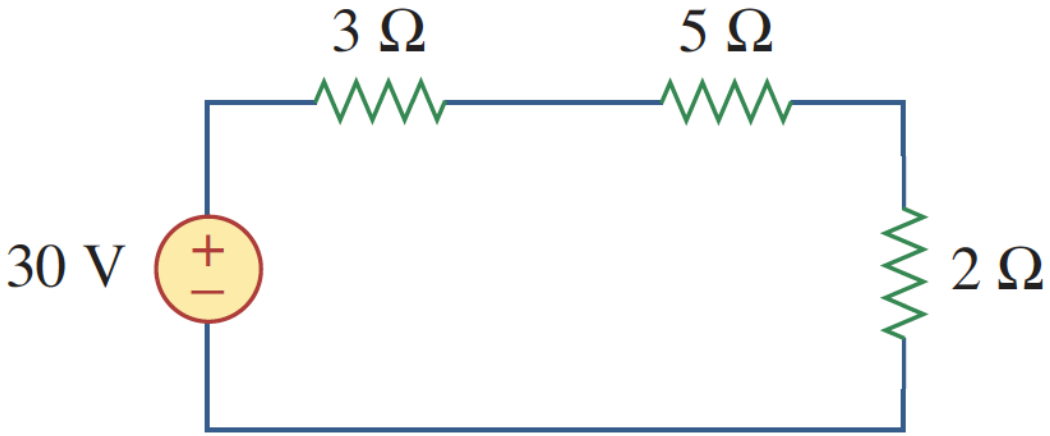
$-3.75\ V$

Example: find v



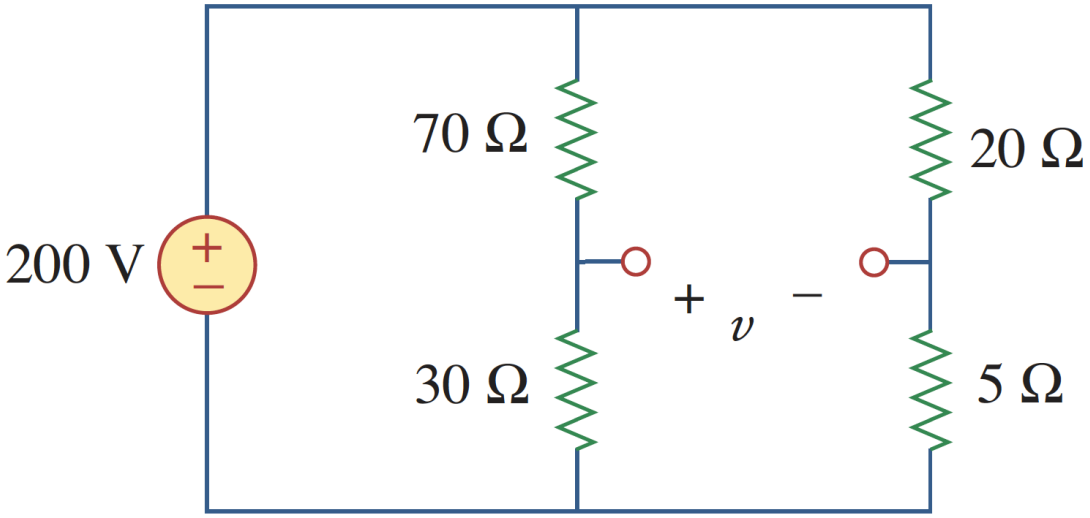
$27\ W$

Practice problem: find the power in the 3 Ω resistor



$20\ V$

Practice problem: find v



$1152\ W$

Practice problem: find the power in the 50 Ω resistor