Aula 4 - Exercise Class 1

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Kirchhoff's Laws (2.4)

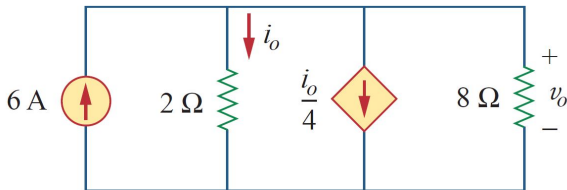Voltage Division (2.5) and Current Division (2.6)

Nodal Analysis (3.2)

Mesh Analysis (3.4)

Fundamentals of Electric Circuits (Alexander and Sadiku), 4th Edition
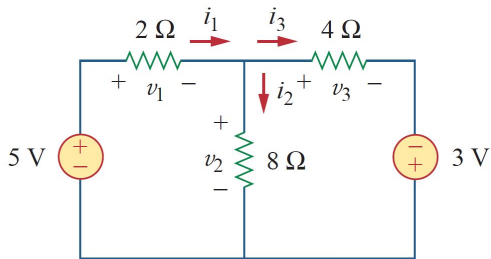
Kirchhoff's Laws

Practice Problem 2.7 - Find v_0 and i_0 in the circuit.

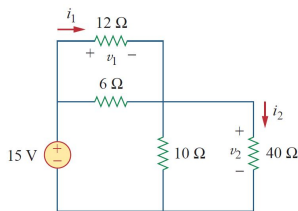

Answer: $i_0 = 4A \ and \ v_0 = 8V$

Kirchhoff's Laws

Practice Problem 2.8 - Find the currents and voltages in the circuit shown.

Answer: $v_1 = 3V, v_2 = 2V, v_3 = 5V, i_1 = 1.5A, i_2 = 0.25A$ *and* $i_3 = 1.25V$
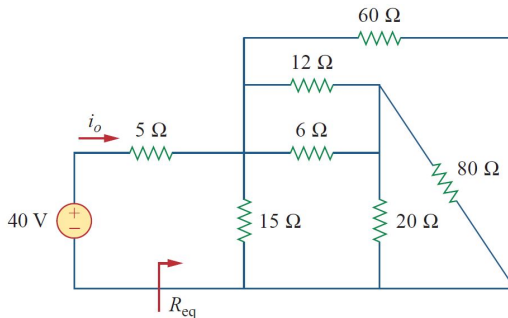
Voltage Division and Current Division

Practice Problem 2.12 - Find v_1 and v_2 in the circuit shown. Also calculate i_1 and i_2 the power dissipated in the 12Ω and 40Ω resistors.

Answer: $v_1 = 5V, i_1 = 416.7mA, p_1 = 2.083W, v_2 = 10V, i_2 = 250mA$ and $p_2 = 2.5W$
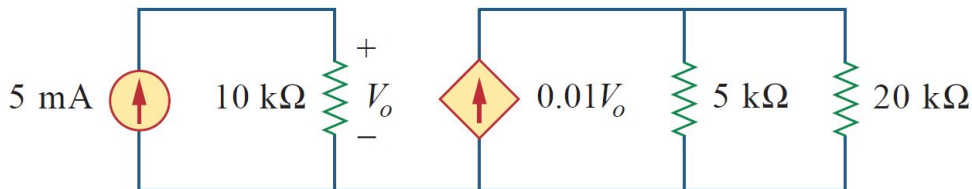
Equivalent Resistance

Problem 2.38 - Find R_{eq} and i_o in the circuit.
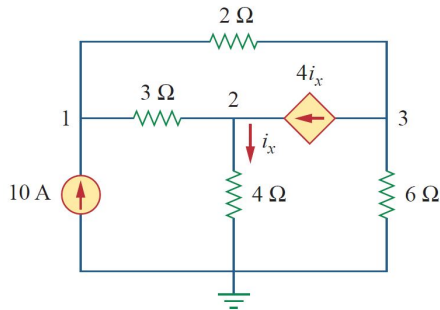
Nodal Analysis

Problem 2.25 - For the network, find the current, voltage, and power associated with the 20-kΩ resistor.

Answer: $i = 0.1A, v = 2kV,$ and $p = 0.2kW$
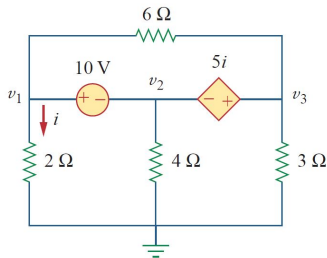
Nodal Analysis

Practice Problem 3.2 - Find the voltages at the three nonreference nodes in the circuit.

Answer: $v_1 = 80V, v_2 = -64V,$ and $v_3 = 156V$
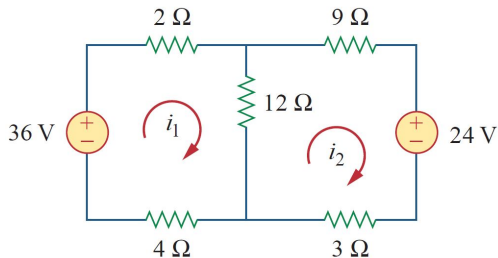
Nodal Analysis

Practice Problem 3.4 - Find v_1, v_2 and v_3 in the circuit using nodal analysis.

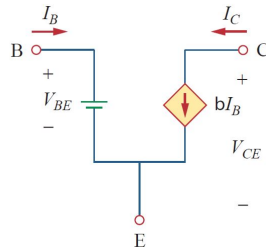Answer: $v_1 = 3.043V, v_2 = -6.956V,$ *and* $v_3 = 0.6522V$

Mesh Analysis

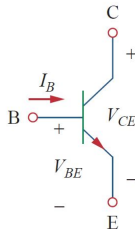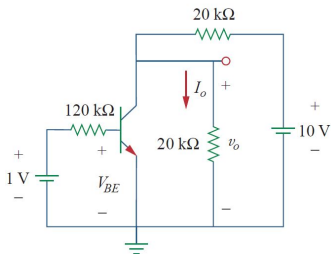**Practice Problem 3.5** - Calculate the mesh currents and of the circuit.

Answer: $i_1 = 2A$ *and* $i_2 = 0A$

Mesh Analysis

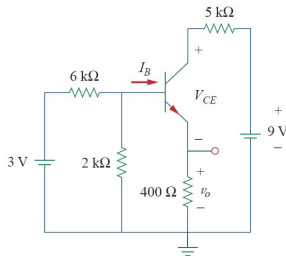**Practice Problem 3.13** -The transistor circuit has $\beta = 80$ and $v_{BE} = 0.7V$. Find v_0 and i_0.

Answer: $v_0 = 3V$ and $i_0 = 150\mu A$

Mesh Analysis

Problem 3.91 - For the transistor circuit, find I_B, V_{CE} and v_o. Take $\beta = 200$ and $V_{BE} = 0.7V$.

Answer: $v_B = 0.61/muA$, $V_{CE} = 8.34V$ and $v_0 = 49mA$