Aula 9 - Exercise Class 3

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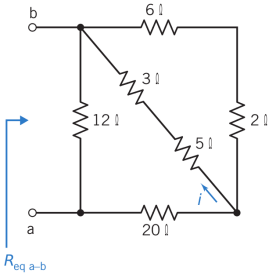
Contents

Introduction to Electric Circuits by James A. Svoboda, Richard C. Dorf, 9th Edition

Resistive Circuits

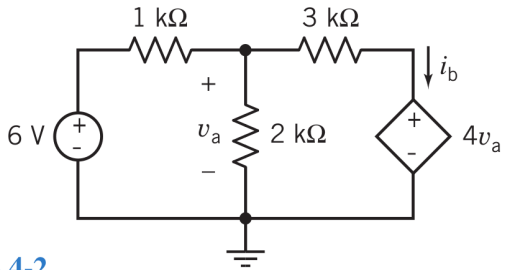
Problem 3.6-11 - Find i and $R_{eq\ a-b}$ if $v_{ab} = 40$ V in the circuit of Figure below.



Answer: $i = \frac{5}{6}A$ and $R_{eq\ a-b} = 8\Omega$.

Methods of Analysis of Resistive Circuits

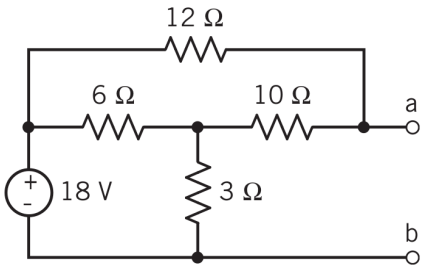
Problem 4.4-2 - Find i_b for the circuit shown in Figure below.



Answer: $i_b = -12mA$.

Circuit Theorems

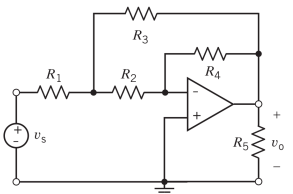
Problem 5.4-4 -Find the Thevenin equivalent circuit for the circuit shown in Figure below.



Answer: $v_t = 12V \; and \; R_t = 6\Omega$

Operational Amplifier

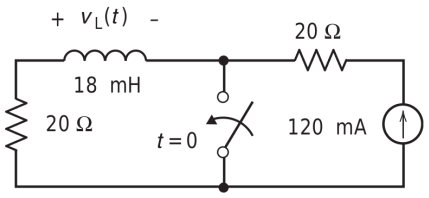
Problem 6.4-161 - The circuit shown in Figure below has one input, v_s , and one output, v_o. Express the gain $\frac{v_o}{v_s}$ in terms of the resistances R_1 , R_2 , R_3 , R_4 , and R_5. Design the circuit so that $v_o = -20v_s$.



Answer: $\frac{v_o}{v_s} = \frac{-R_3R_4}{R_1R_2+R_1R_3+R_2R_3+R_1R_4}$ and $R_1 = 1\Omega$, $R_2 = 78\Omega$, $R_3 = 100\Omega$ e $R_4 = 2000\Omega$

Energy Storage Elements

Problem 7.8-6 - The switch in the circuit shown in Figure below has been open for a long time before it closes at time $t = 0$. Determine the values of $v_L(0^-)$, the voltage across the inductor immediately before the switch closes, and $v_L(0^+)$, the voltage across the inductor immediately after the switch closes.



Answer: $v_L(0^-) = 0V$ and $v_L(0^+) = 2.4V$