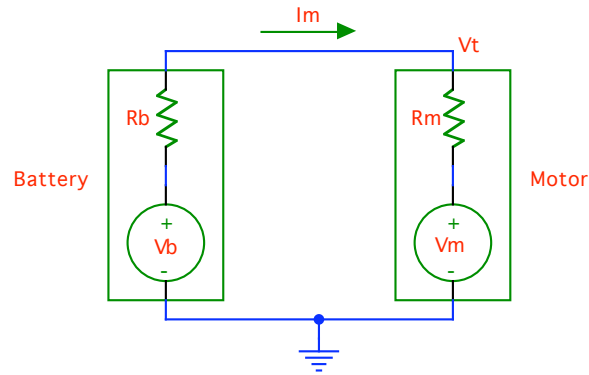


ECE 211 Fall 2003

Homework Two

(Due 9/24/03 at the beginning of discussion.)

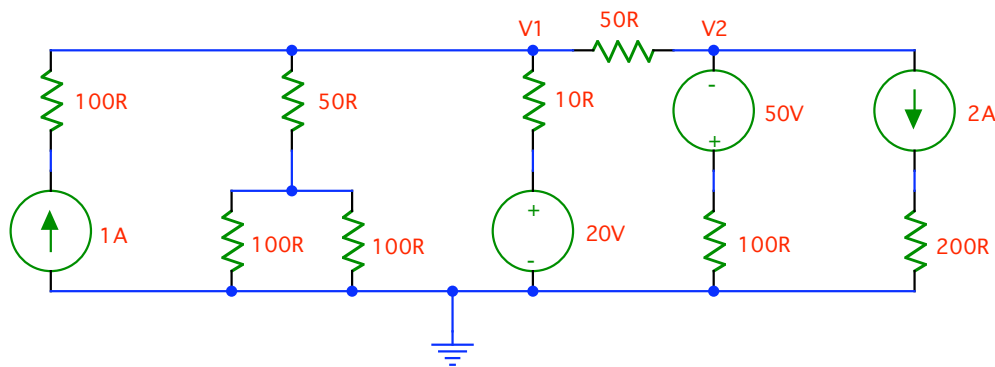
Problem One:



In the above circuit a battery is driving a DC motor. The motor voltage V_m is related to the motor speed and is 0.25V/RPM [0.25 Volts for each RPM (revolution per minute) the motor turns]. The motor speed is 40 RPM. $V_b = 24\text{V}$, $R_b = 0.4\Omega$, and $R_m = 0.1\Omega$.

- What is the motor current I_m ?
- What is motor terminal voltage V_t ?
- What is the power supplied to the motor (R_m and V_m)?
- How much of the power from c) is dissipated in the motor and how much is converted to mechanical energy (hint: R_m dissipates power, V_m doesn't)?

Problem Two:



For the above circuit:

- What are the voltages V_1 and V_2 ?
- What power is supplied by each source (4 answers with signs, + for supplied, - for absorbed)?
- What power is dissipated by each resistor (8 answers)?
- Show that the sum of the power dissipated by the resistors equals the sum of the power supplied by the sources?