

Problems from the book: 4.61, 4.65, 4.68, 4.72, 4.75, 4.77, 4.86, 4.87, 4.88, 4.92

1. Using MATLAB solve for v_x in Figure P4.56 in the book. Use the following MATLAB functions (rand, std, and mean).
 - a. If each resistor varies by 20% what is the average and standard deviation for v_x ? Use at least 1000 samples.
 - b. If each resistor varies by 5% what is the average and standard deviation for v_x ? Use at least 1000 samples.
 - c. Using this statistical approach, which resistor is most critical with respect to variations in v_x ? Do this by only varying one resistor at a time.

Help: If the resistors are the exact values shown in Fig. P4.56 then $v_x=40V$ and $i_x=5A$.

2. For problem 4.86 use MATLAB to plot the power absorbed in the variable resistor as a function of the resistance.
3. For problem 4.88 use MATLAB to plot the power absorbed in the variable resistor as a function of the resistance.
4. Figure 1 is the circuit for a common emitter amplifier.
 - a. Find the Thevenin Equivalent between terminals a and a' in Figure 1. (This Thevenin resistance is called the output impedance.)
 - b. Remove the 3V source and find the Thevenin Equivalent between terminals b and b' in Figure 1. (This Thevenin resistance is called the input impedance.)

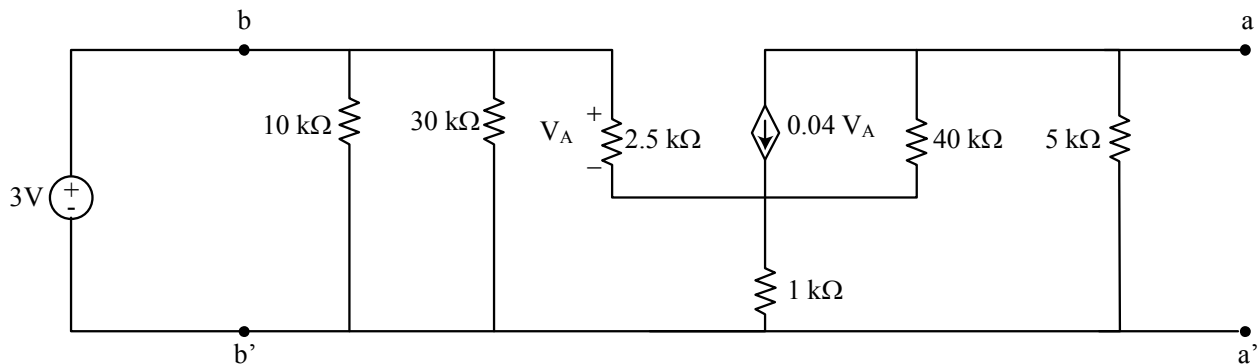


Figure 1

5. Figure 2 is the circuit for a common base amplifier.
 - a. Find the Thevenin Equivalent between terminals a and a' in Figure 1. (This Thevenin resistance is called the output impedance.)
 - b. Remove the 3V source and find the Thevenin Equivalent between terminals b and b' in Figure 2. (This Thevenin resistance is called the input impedance.)

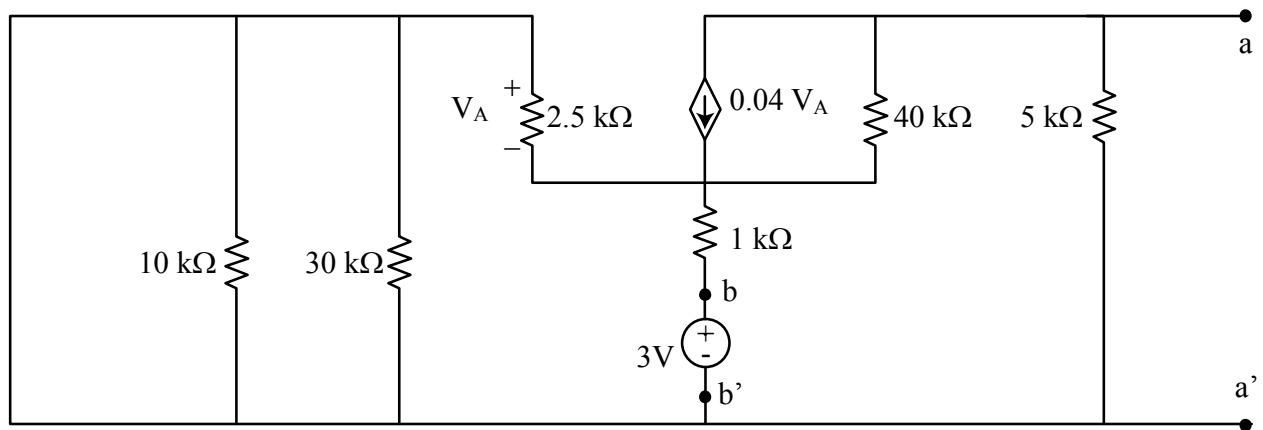


Figure 2