Chapter 3:

**Problem 1:** Use nodal analysis to find both $i_o$ and $v_o$. Note that this circuit is a typical equivalent model for a transistor.

**Problem 2:** Use mesh analysis to find the voltage drop across and current through the center 4Ω resistor that is connected to ground (*not* the top or upper 4Ω resistor).
Chapter 4:

Problem 3
Using superposition, find the current through and power absorbed by the 8 Ω resistor.

Problem 4
Using source transformation, find the current through and power absorbed by the 8 Ω resistor.
**Problem 5**
Apply Thevenin’s theorem to find $V_0$ in the circuit below.

![Circuit Diagram]

**Problem 6**
The Thevenin equivalent at terminals $a-b$ of the linear network shown below is to be determined by measurement.

When a 10 kΩ resistor is connected to terminals $a-b$, the voltage $V_{ab}$ is measured as 6 V. When a 30 kΩ resistor is connected to the terminals, $V_{ab}$ is measured as 12V.

Determine:
  a) The Thevenin equivalent at terminals $a-b$.
  b) $V_{ab}$ when a 20 kΩ resistor is connected to terminals $a-b$.
  c) The maximum power that can be delivered to a load from this electrical box

![Linear Network Diagram]
Related to our Op Amp lab on Oct 4

Problem 7: Given the two functions:

1) $f_1 = 50 \text{ feet}$ (a constant function)
2) $f_2 = 75 \cos(\omega t) \text{ feet}$

Sketch $f_1$, $f_2$ and the indicated $f_3$ by hand, very neatly (using the graph paper that is part of the EGR paper you use for your homework) the following functions.

Sketch different graphs for parts a, b and c.

a) $f_3 = f_1 + f_2$
b) $f_3 = -f_2$
c) $f_3 = -(1/6) (f_1) - (1/5) (f_2)$