ECE 101: Homework assignment # 2

Additional topics covered since previous HW: lab3, more electric circuits, quadratic equations, problem solving.

Practice problem(s)

Find the current Ix in the 5 Ohm resistor in the circuit below. The source in this problem is a current source; it supplies a constant 36 A going into the resistors. Hint: this problem also takes two steps. First, combine the three resistors on the right into a single equivalent resistor, and use current division to find the current in the top right-hand 10 Ohm, say "I₁". Then use current division again to find Ix from I₁. (Solution: Ix= 12 A)



Turn in solutions to the following problems:

1. Analyze the circuit below and answer:



- a. Find the total equivalent resistance seen from the source. (Hint: combine the resistors that are in parallel first.)
- b. Use the equivalent resistance to find i1.
- c. Use current division to find i2. (Note that i1 splits between the two 4 Ohm resistors.)
- d. Use voltage division to find v. (Hint: combine the resistors that are in parallel as you did in step a.)
- e. What is the power in the 6 Ohm resistor?
- 2. Solve problem 2-6 from R&K (quadratic equations)
- 3. A child's pool is eight feet in diameter and two feet high. It is filled by a garden hose up to a level of one foot. The children complain that it is too cold. Can you heat it up to an acceptable temperature using hot water from the house? How much water would need to add? (Hint: explicitly state your assumptions; try to follow steps given for problem solving and explain your reasoning)