

ECE203 DC Circuits

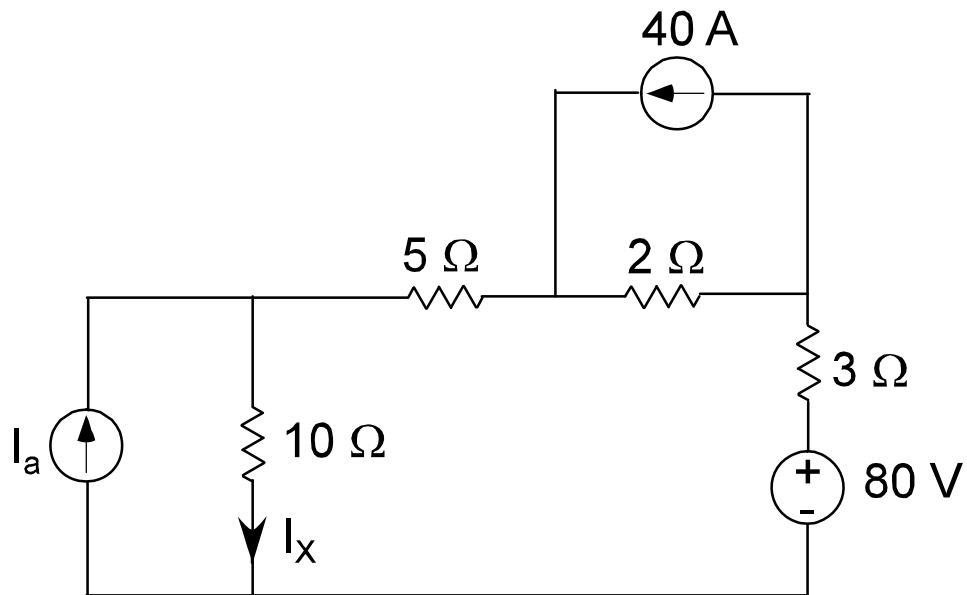
Midterm Exam 3A 11/5/2009

NAME: _____

- **NO PARTIAL CREDIT WILL BE GIVEN** without a full explanation of the procedure followed to arrive at your solution.
- An 8 ½ x11 inch formula sheet may be used. Laptops may not be used.
- Time allowed : 50 minutes.
- Put a box around your solution. **DON'T FORGET UNITS AND CONDITIONS ON VALIDITY.**
- You may use both sides of this sheet of paper for your answer. Please use the back of the previous page.

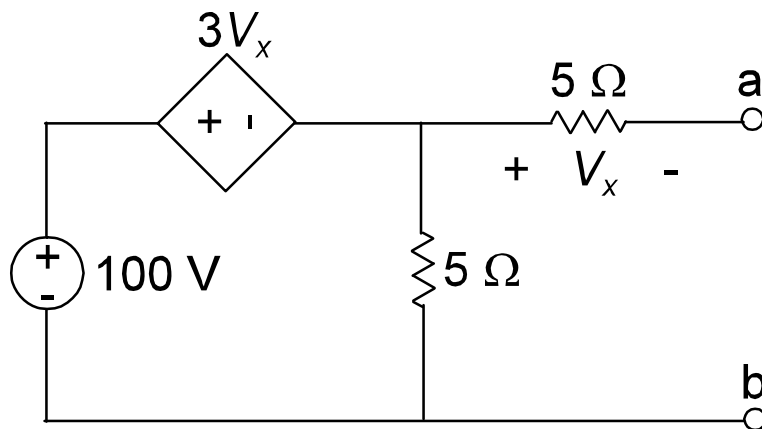
Question #	Possible Points	Awarded Points
1	25	
2	25	
3	25	
4	25	
Total	100	

1.
 - a) Use superposition to determine the value of I_a that will make $I_x = 10$ A.
 - b) What percentage of the 40 A source flows in I_x ?



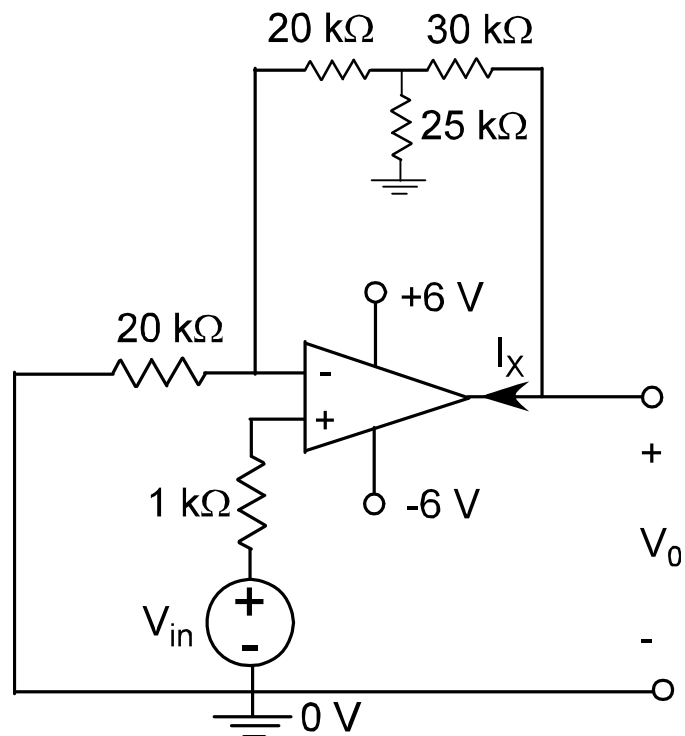
Answer: $I_a = 4\ \text{A}$.

2. Determine the maximum power that can be drawn out of the terminals a—b.



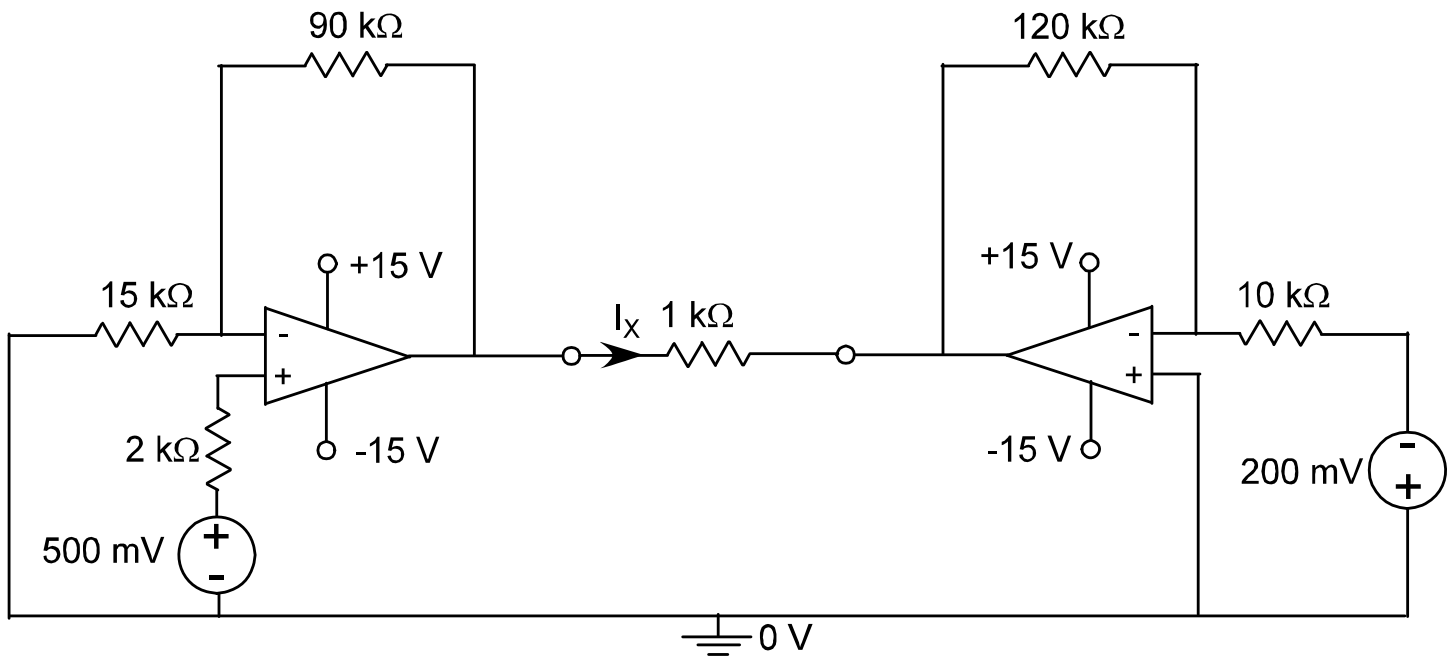
Answer: $P_{\max} = 125\ \text{W}$.

3. Determine V_0 and I_X , assuming the op-amp and power supplies are ideal, when:
- $V_{in} = 1 \text{ V}$.
 - $V_{in} = 2 \text{ V}$.



- Answer: $I_X = -130 \mu\text{A}$ $V_0 = 5.9 \text{ V}$
- Answer: $I_X = -119 \mu\text{A}$ $V_0 = 6.0 \text{ V}$

4. Determine I_x , assuming the op-amps and power supplies are ideal.



Answer: $I_x = 1.1\text{ mA}$