

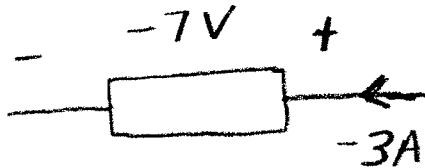
EE212 Test 1

The weighting of each problem is not necessarily the same.

Test Instructions:

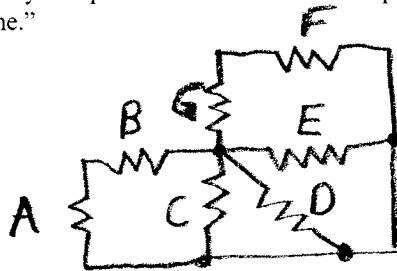
1. This is a closed book, closed notes examination. No additional tables, including integral tables, may be used.
2. Calculators, computers, and other electronic computational devices are not permitted.
3. You may work in the test booklet.
4. Provide only your final solutions on the test answer sheet.
5. Provide units on all answers.
6. The length of the examination is 2 hours.
7. For the final grade, only the answers on the answer sheet will be graded.
8. These problems are graded right or wrong. (In most cases there is no partial credit.) If multiple solutions or intermediate work are provided, the solution is considered incorrect. Use parenthesis when needed.

1. Briefly provide one reason "other engineering students need to learn the fundamentals of electrical engineering."
2. Compute the absorbed power for the element shown.

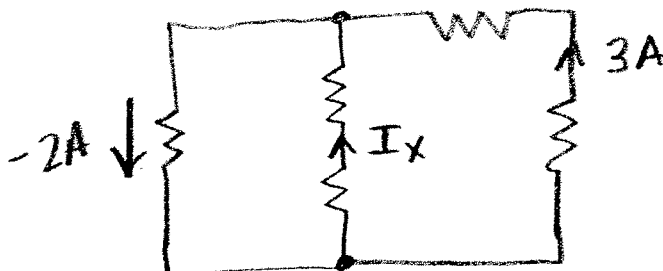


$$P = (-7)(-3)$$

3. Identify one pair of elements that are in parallel in the following circuit. If there are none, state "none."

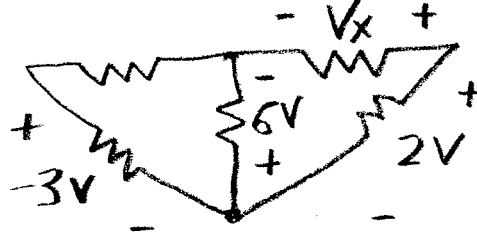


4. Using KCL, determine the current I_x for the given circuit.



$$\begin{aligned} I_x + 3 + (-2) &= 0 \\ I_x + 5 &= 0 \end{aligned}$$

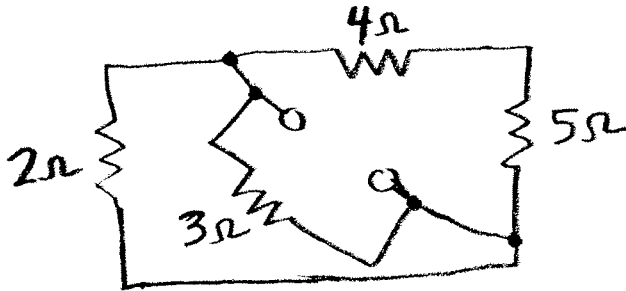
5. Using KVL, determine the voltage V_x for the given circuit.



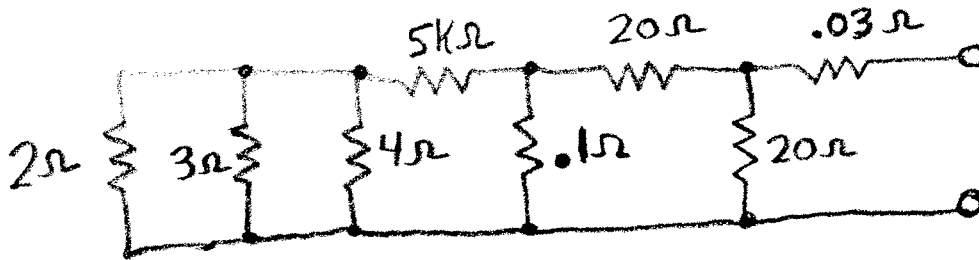
$$-V_x + 2 + 6 = 0$$

$$V_x = 8V$$

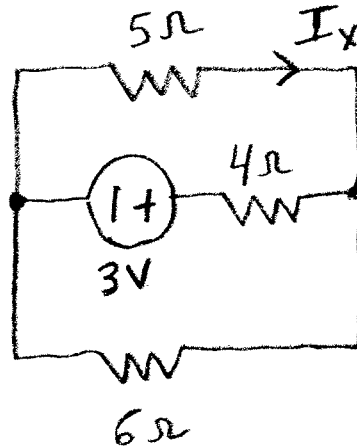
6. Determine the equivalent resistance seen by the two terminals. Do not simplify the expression. If needed, the symbol for two resistive elements in parallel (e.g., $R_1 \parallel R_2$) may be used.



7. As done in class, estimate the equivalent resistance seen by the two terminals. One numerical answer should be provided. It should be within 10% of the exact answer.



8. Determine the current I_x for the given circuit using series and parallel equivalents. Do not simplify the expression. If needed, the symbol for two resistive elements in parallel (e.g., $R_1 \parallel R_2$) may be used.



$$\frac{-3}{(6 \parallel 5) + 4} \cdot (5 \parallel 6) / 5$$

51 pts total

Printed Name: SOLN

Signature: _____

Answer Sheet (Provide Units)

UNITS +2 pts

1 1. Pass EE Portion of FE

1 2. 21 W $+\frac{1}{2}$ pt. sign

1 3. E & D, CED

1 4. -5 A $+\frac{1}{2}$ pt sign

1 5. 8 V $+\frac{1}{2}$ pt sign

} if magnitude correct

2 6. $(4+5) // 2 // 3 \ \Omega$

2 7. $\approx 10 \ \Omega$

4 8. $\frac{-3}{(6//5)+4} (5//6) / 5 \ A$

-1 if current/voltage division used

3 9. $-3 \times (4//6) \ V$

-1 if current/voltage division used

4 10. $\frac{3}{(5//6)+4} \frac{6}{5+6} \ A$

sign $\frac{1}{2}$

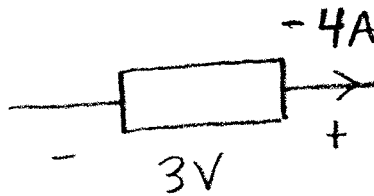
EE212 Test 1

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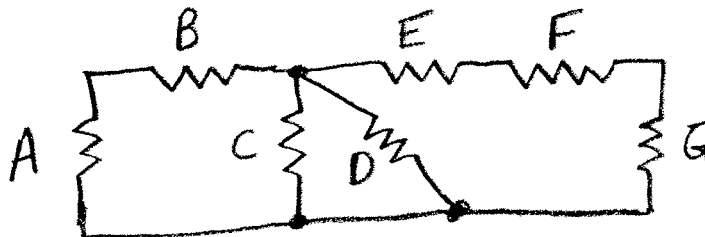
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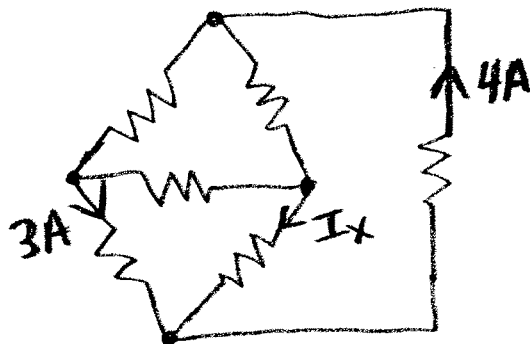
1. Briefly provide one reason "other engineering students need to learn the fundamentals of electrical engineering."
2. Compute the absorbed power for the element shown.



3. Identify one pair of elements that are in parallel in the following circuit. If there are none, state "none."



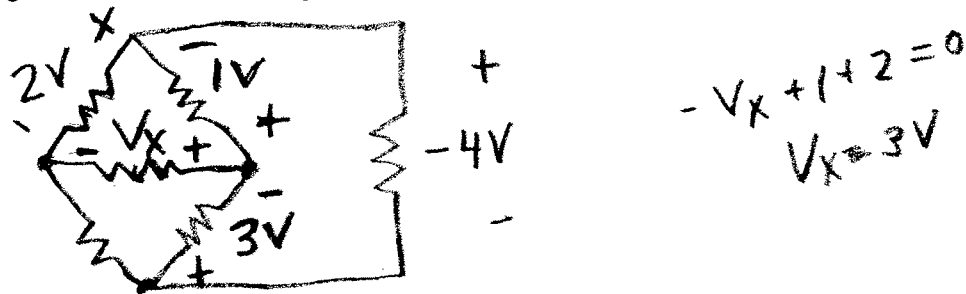
4. Using KCL, determine the current I_x for the given circuit.



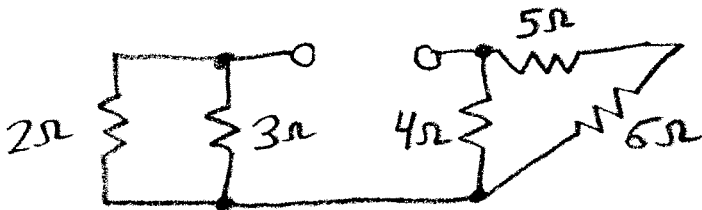
$$I_x + 3 - 4 = 0$$

$$I_x = 1 \text{ A}$$

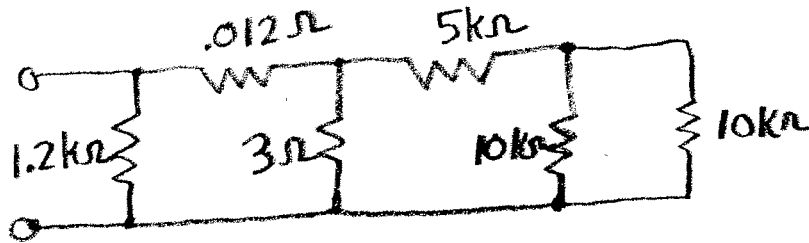
5. Using KVL, determine the voltage V_x for the given circuit.



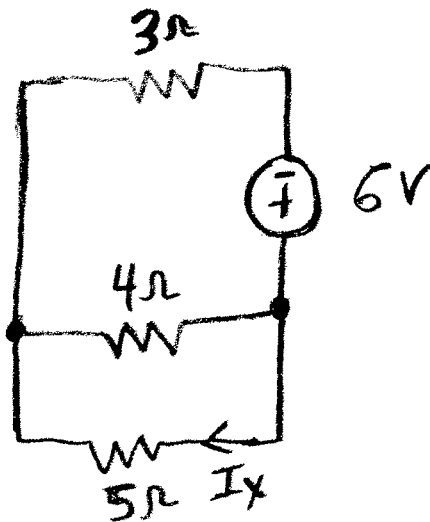
6. Determine the equivalent resistance seen by the two terminals. Do not simplify the expression. If needed, the symbol for two resistive elements in parallel (e.g., $R_s \parallel R_L$) may be used.



7. As done in class, estimate the equivalent resistance seen by the two terminals. One numerical answer should be provided. It should be within 10% of the exact answer.



8. Determine the current I_x for the given circuit using series and parallel equivalents. Do not simplify the expression. If needed, the symbol for two resistive elements in parallel (e.g., $R_s \parallel R_L$) may be used.



Printed Name: SOLN

51 pts total

Signature: _____

+2 units

Answer Sheet (Provide Units)

1 1. communicate with EEs1 2. 12 W $\frac{1}{2}$ pt sign1 3. C & D1 4. 1 A $\frac{1}{2}$ pt sign } if magnitude1 5. 3 V $\frac{1}{2}$ pt sign } correct2 6. $[(5+6)/4] + (2/3) \Omega$ 2 7. $\approx 3 \Omega$ 4 8. $\frac{+5}{(4/5)+3} \times (4/5) / 5 \text{ A}$ $\frac{1}{2}$ pt sign3 9. $-5 \times [(3+4)/2] \checkmark$ $\frac{1}{2}$ pt sign4 10. $\frac{+3}{4+(5/6)} \times \frac{5}{5+6} \text{ A}$ $\frac{1}{2}$ pt sign

-1 each if current/voltage division used

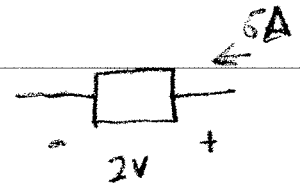
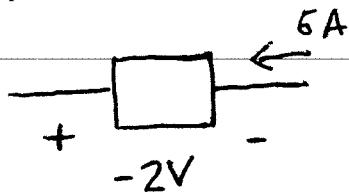
EE312 Test 1

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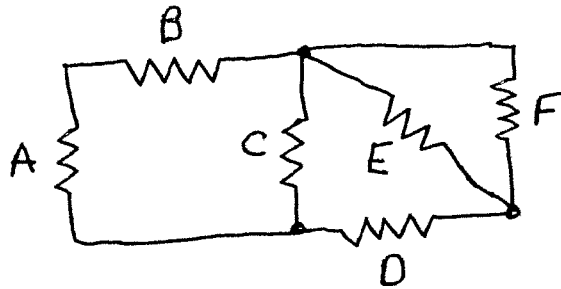
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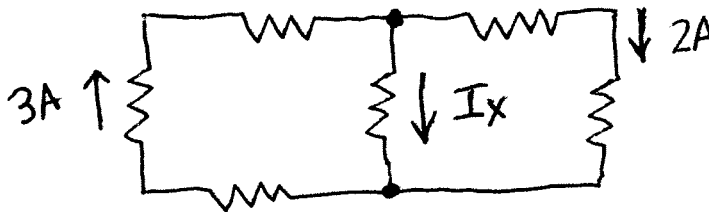
1. Briefly provide one reason "other engineering students need to learn the fundamentals of electrical engineering."
2. Compute the absorbed power for the element shown.



3. Identify one pair of elements that are in parallel in the following circuit. If there are none, state "none."

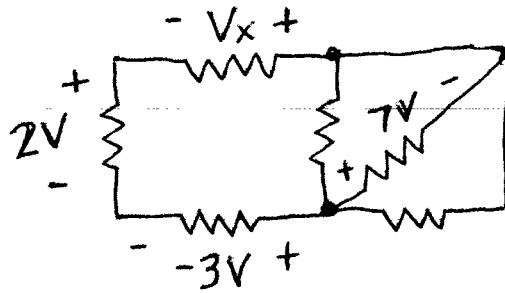


4. Using KCL, determine the current I_x for the given circuit.



$$\begin{aligned} I_x + 2 - 3 &= 0 \\ I_x - 1 &= 0 \\ I_x &= 1A \end{aligned}$$

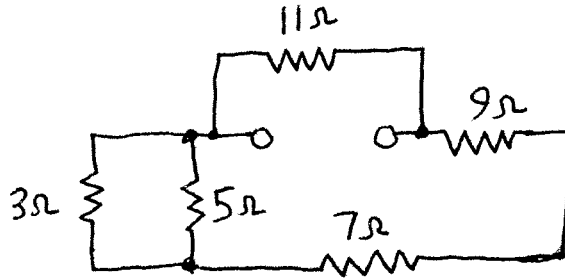
5. Using KVL, determine the voltage V_x for the given circuit.



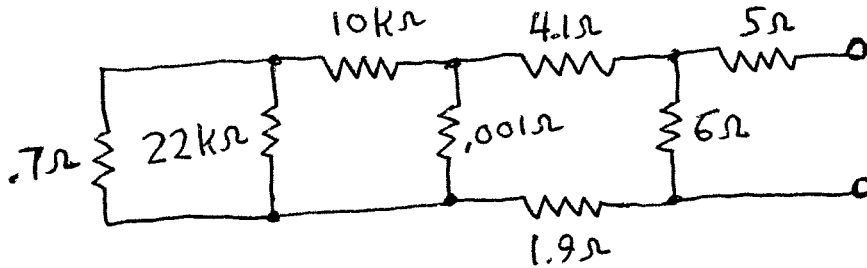
$$-V_x - 7 + (-3) - 2 = 0$$

$$V_x = -12 \text{ V}$$

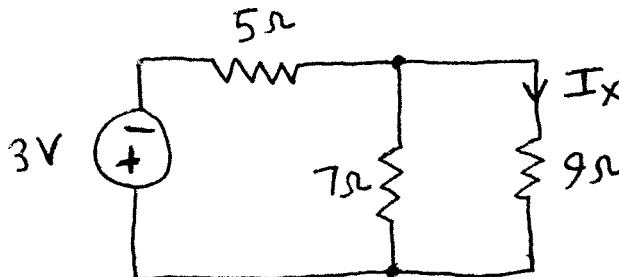
6. Determine the equivalent resistance seen by the two terminals. Do not simplify the expression. If needed, the symbol for two resistive elements in parallel (e.g., $R_1 \parallel R_2$) may be used.



7. As done in class, estimate the equivalent resistance seen by the two terminals. One numerical answer should be provided. It should be within 10% of the exact answer.



8. Determine the current I_x for the given circuit using series and parallel equivalents. Do not simplify the expression. If needed, the symbol for two resistive elements in parallel (e.g., $R_1 \parallel R_2$) may be used.



Printed Name: SOLUTION

Signature: _____

Answer Sheet (Provide Units)

1. PE, EIT Tests, Licenses, Communications etc.

2. 12 W

3. E & F

4. 1 A

5. -12V

6. $[(3||5)+7+9]||11 \Omega$

7. 8Ω

8. $\frac{-3}{(7||9)+5} \times \frac{7}{7+9}$ OR $-3 \frac{7||9}{(7||9)+5} \times \frac{1}{2} A$

9. $3 \times (7||9)$ OR $3 \times \frac{9}{7+9} \times 7 V$

10. $\frac{3}{(7||9)+5} \times \frac{7}{7+9} A$

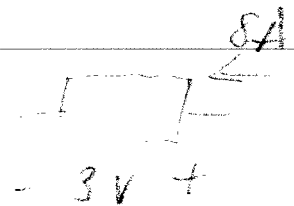
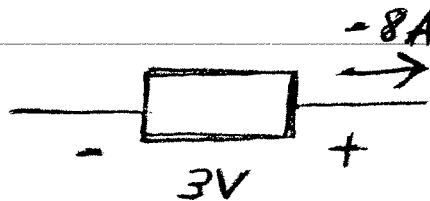
EE212 Test 1

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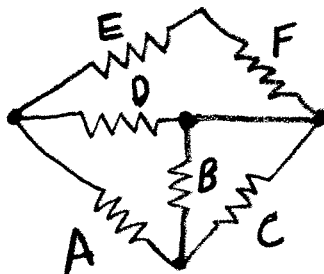
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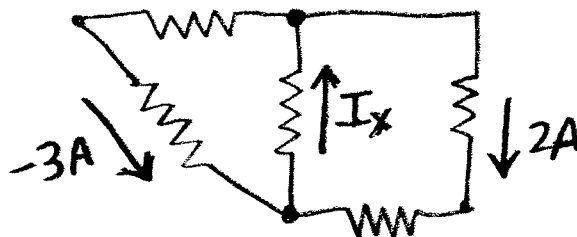
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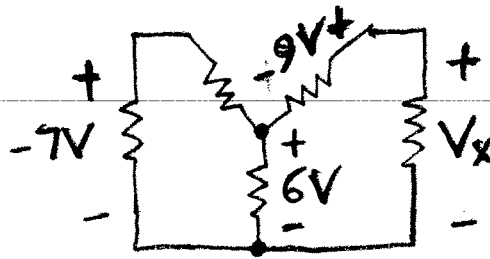


4. Using KCL, determine the current I_x for the given circuit.



$$\begin{aligned} -I_x + 2 - 3 &= 0 \\ I_x &= -1 \end{aligned}$$

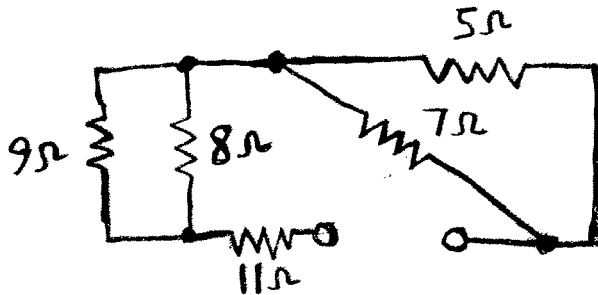
5. Using KVL, determine the voltage V_x for the given circuit.



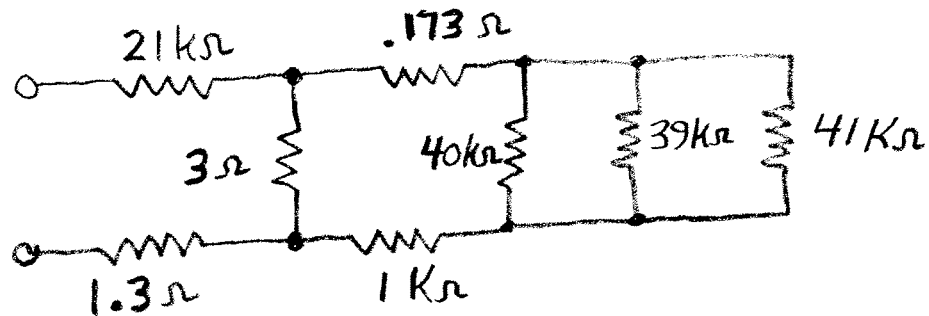
$$-V_x + 9 + 6 = 0$$

$$V_x = 15V$$

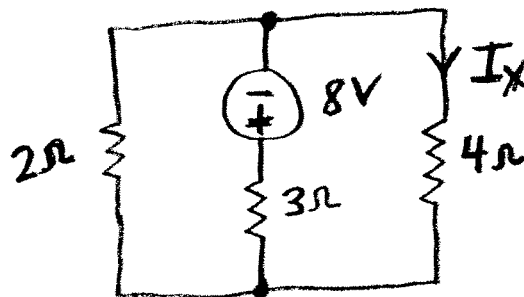
6. Determine the equivalent resistance seen by the two terminals. Do not simplify the expression. If needed, the symbol for two resistive elements in parallel (e.g., $R_1 \parallel R_2$) may be used.



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8. Determine the current I_x for the given circuit using series and parallel equivalents. Do not simplify the expression. If needed, the symbol for two resistive elements in parallel (e.g., $R_1 \parallel R_2$) may be used.



51 pts total

Printed Name: SOLN

Signature: _____

Answer Sheet (Provide Units)

UNITS + 2

1 1. pass PE/EIT etc.

1 2. 24 W $\frac{1}{2} P + 51^{\sim}$

1 3. BEC

1 4. -1 A

1 5. 15 V

2 6. $(5/7) + (8/9) + 11 \Omega$

$9/(5/7/8) + 11 \Omega$
 $(5/7 + 8/9) + 11 \Omega$
 $(8/9 + 11.5/7) \Omega$

2 7. 21 k Ω

4 8. $\frac{-8}{(2/4)+3} \cdot \frac{(2/4)}{4} A$

3 9. $5(3/7) V$

4 10. $-\frac{5}{(4/6)+3} \cdot \frac{6}{4+6} A$