ECE 2210 / 00   homework # 4
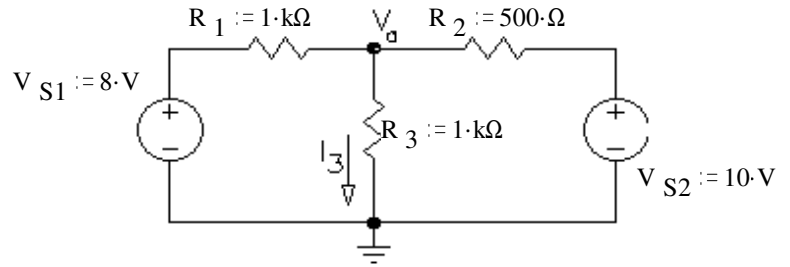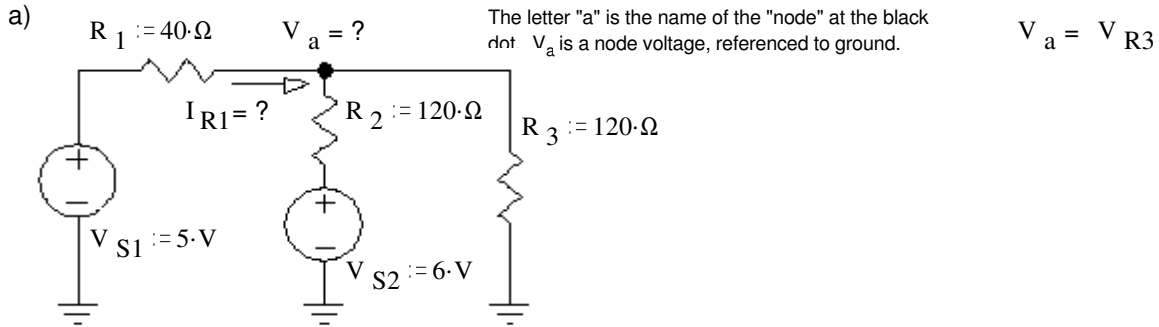
Answer the following problems on your own paper. Show your equations and work to get credit on this and all future homeworks.
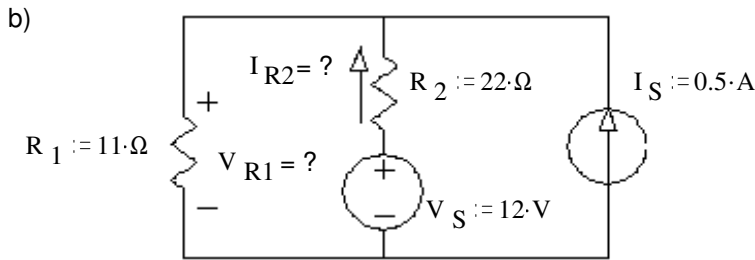
Superposition

1. Use superposition to find I_3. Circle your intermediate solutions on your paper. Your intermediate solutions show how much of I_3 is due to V_{S1}, and how much is due to V_{S2}.

$R_1 := 1 \cdot k\Omega$ V_a $R_2 := 500 \cdot \Omega$

$V_{S1} := 8 \cdot V$

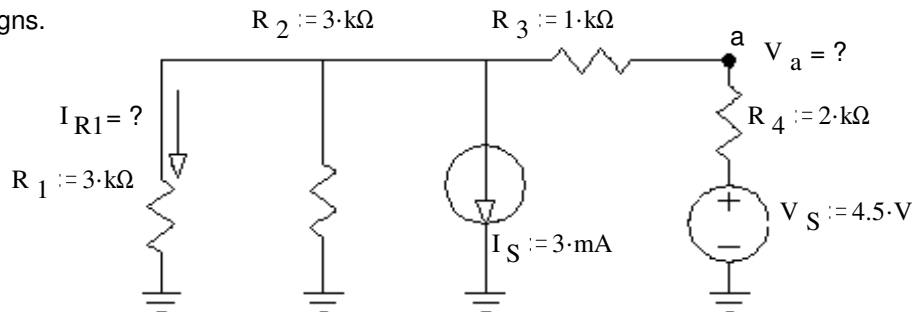$R_3 := 1 \cdot k\Omega$

I_3

$V_{S2} := 10 \cdot V$

2. Use superposition to solve following problems: Each problem asks for both a current and a voltage.
   Clearly indicate your intermediate answers, the grader will look for those.

a)
$R_1 := 40 \cdot \Omega$ $V_a = ?$

The letter "a" is the name of the "node" at the black dot V_a is a node voltage, referenced to ground.

$V_a = V_{R3}$

$I_{R1} = ?$ $R_2 := 120 \cdot \Omega$ $R_3 := 120 \cdot \Omega$

$V_{S1} := 5 \cdot V$

$V_{S2} := 6 \cdot V$

These are ground symbols. They are all connected together, although that connection is not explicitly shown.

b)
$I_{R2} = ?$ $R_2 := 22 \cdot \Omega$ $I_S := 0.5 \cdot A$

$R_1 := 11 \cdot \Omega$ $V_{R1} = ?$

$V_S := 12 \cdot V$

c) Watch your signs. $R_2 := 3 \cdot k\Omega$ $R_3 := 1 \cdot k\Omega$

a $V_a = ?$

$I_{R1} = ?$

$R_4 := 2 \cdot k\Omega$

$R_1 := 3 \cdot k\Omega$

$V_S := 4.5 \cdot V$

$I_S := 3 \cdot mA$

Answers

1. $2 \cdot mA + 5 \cdot mA = 7 \cdot mA$

2. a) $4.2 \cdot V$, $20 \cdot mA$ b) $7.67 \cdot V$, $197 \cdot mA$ c) $0.5 \cdot V$, $-0.5 \cdot mA$

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