Lecture 8 2/10/05

Administrivia

1) http://hkn.eecs.berkeley.edu ← Free tutoring
(EECS Honors Society) (M-F, 10-4)

2) Today → Nothing new ☺, John will answer questions etc.

3) Syllabus change → check online.

4) I have office hours today evening, 5-9 in Free Speech Cafe.

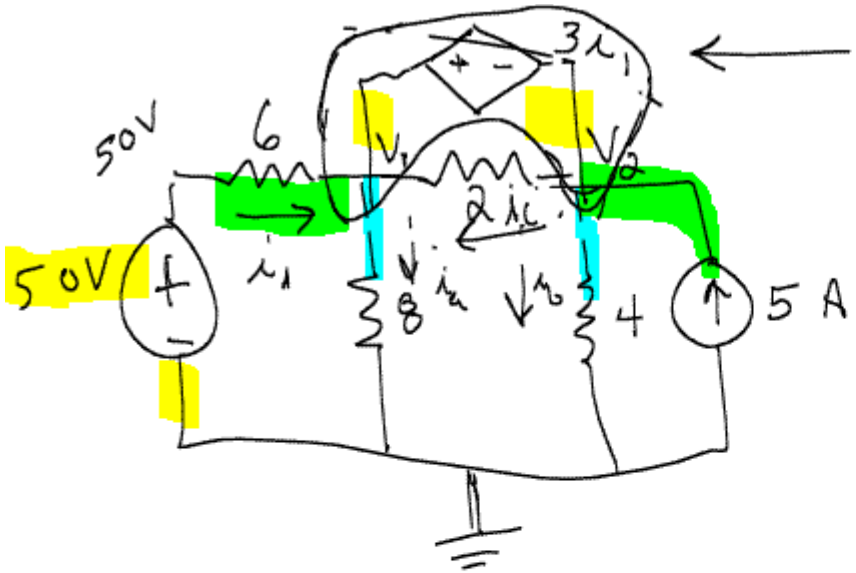
Nodal Analysis

1) Define reference
2) Label unknown nodes (voltages)
3) KCL
4) Solve

Super Node Analysis

1) Define reference
2) Label unknown nodes (voltages)
3) Write down constraint equation
4) Create our super node
5) KCL → Solve

* Use super node analysis when we have a floating voltage source



← Floating voltage source

Constraint Eq.

1) $V_1 - V_2 = 3i_1$ ← $\frac{50 - V_1}{6}$

2) ~~i_1~~ $i_1 + 5 = i_a + i_b$ ~~$+ i_c$~~

2) $\frac{50 - V_1}{6} + 5 = \frac{V_1}{8} + \frac{V_2}{4}$

Power absorbed (dissapated) vs. Power delivered (developed)

Notes: 1) Resistors absorb power

2) Passive sign convention

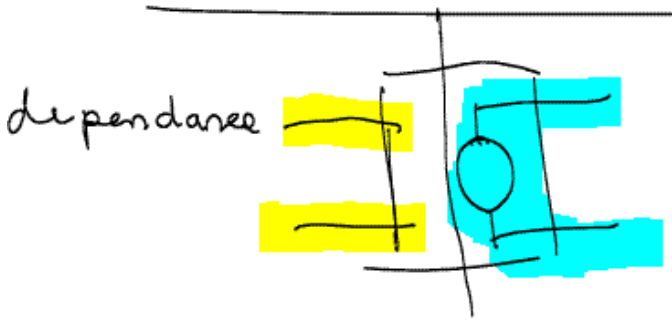
negative sign → power delivered

positive sign → power absorbed

3) Sources (Indep. or dependent) can absorb or deliver power

4) Power absorbed = power delivered

Dependent Sources in PSpice



4 types

1) Voltage dep. voltage source (E)
2) Current dep. current source (F)
3) voltage dep. current source (G)
4) current dep voltage source (H)

$$a_{11}v_1 + a_{12}v_2 + a_{13}v_3 = b_1$$

$$a_{21}v_1 + a_{22}v_2 + a_{23}v_3 = b_2$$

$$a_{31}v_1 + a_{23}v_2 + a_{33}v_3 = b_3$$

$$\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix} \begin{bmatrix} v_1 \\ v_2 \\ v_3 \end{bmatrix} = \begin{bmatrix} b_1 \\ b_2 \\ b_3 \end{bmatrix}$$

$$A \quad \vec{v} = \vec{b}$$

$$\vec{v} = A^{-1}\vec{b}$$