Lecture 6
Basics – 6 of 7

circuit analysis; dependent sources

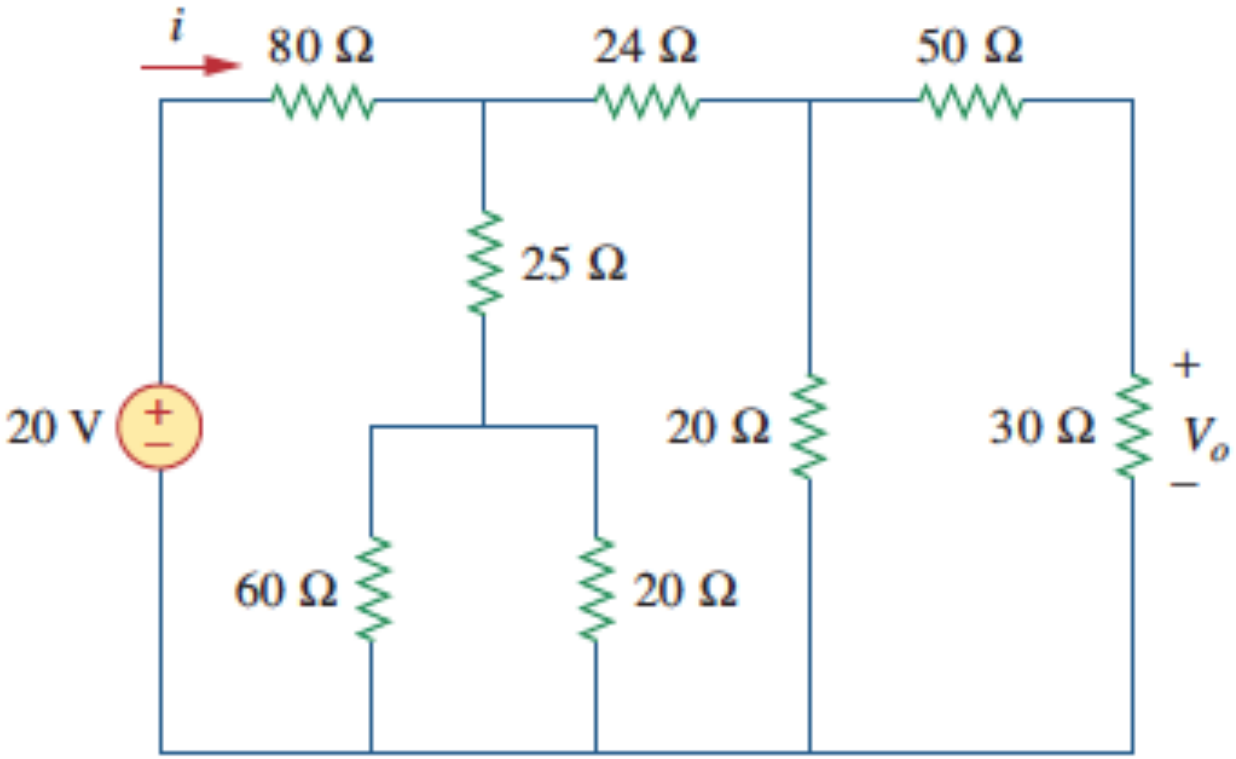
Circuit Analysis

- Noted in the last class that sometimes we can do a full analysis using series/parallel combining, voltage/current division

- Let's do another example or two

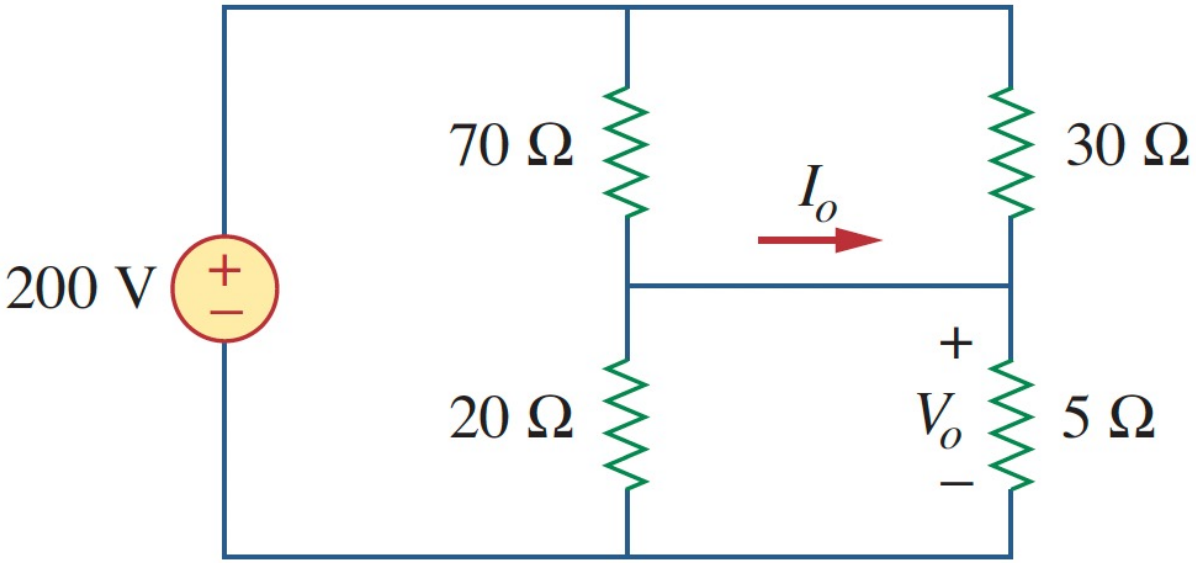
$0.2\ A, 0.6\ V$

Example: find I and V_o

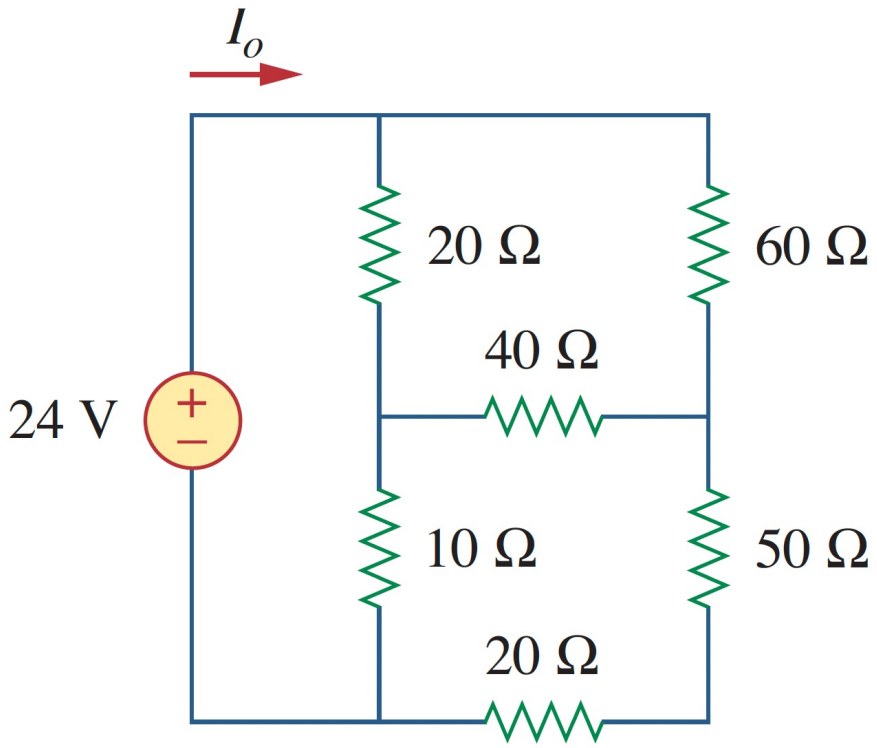


$32\ V, 0.6\ A$

Example: find V_o and I_o



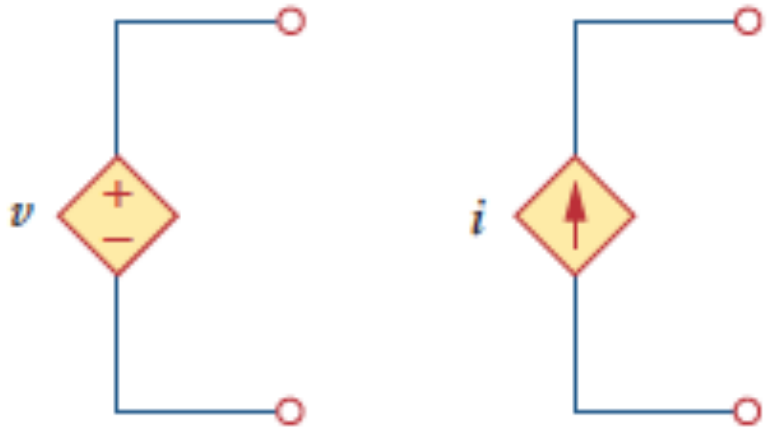
But sometimes you cannot: how do you find the current I_o now?



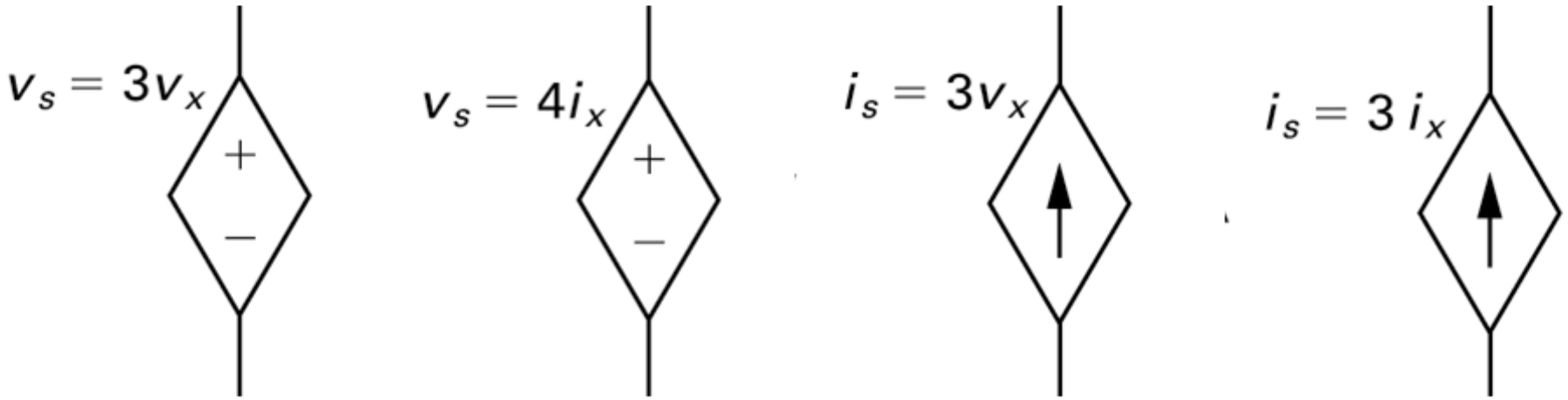
Watch/read materials on Delta-Wye on the course website

Dependent Sources

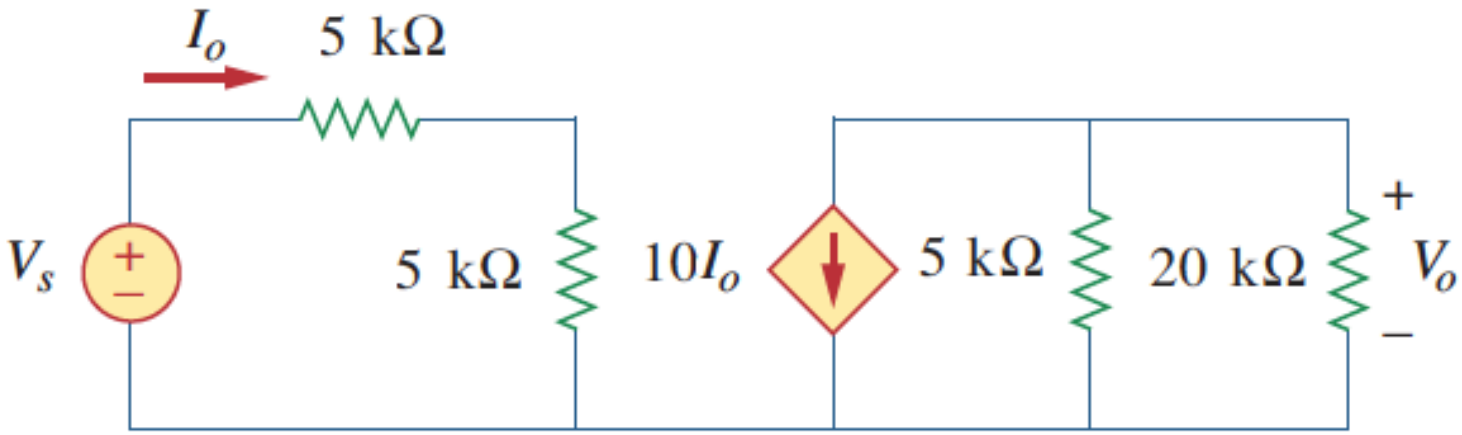
- The voltage or current is dependent upon some other circuit variable
- Drawn as a diamond or rhombus



- A <u>linear</u> relationship to some other circuit variable is common
  - What units does the entire label have?
  - What units does the multiplier have?



Example:



Example:

2.21 Find V_x in the circuit of Fig. 2.85.

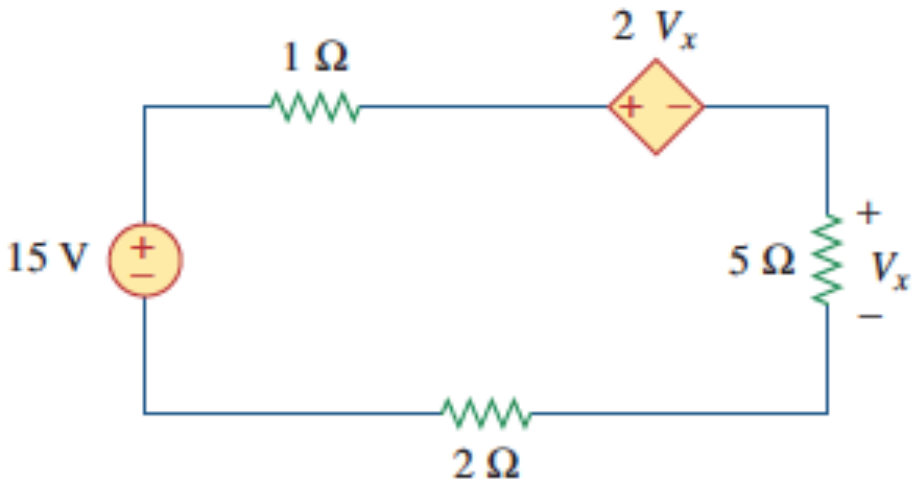
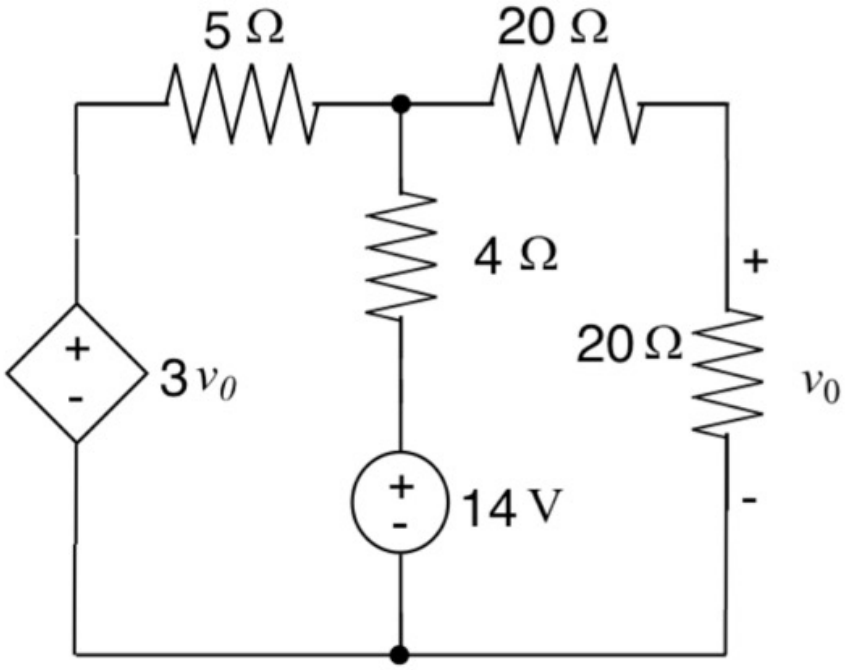


Figure 2.85

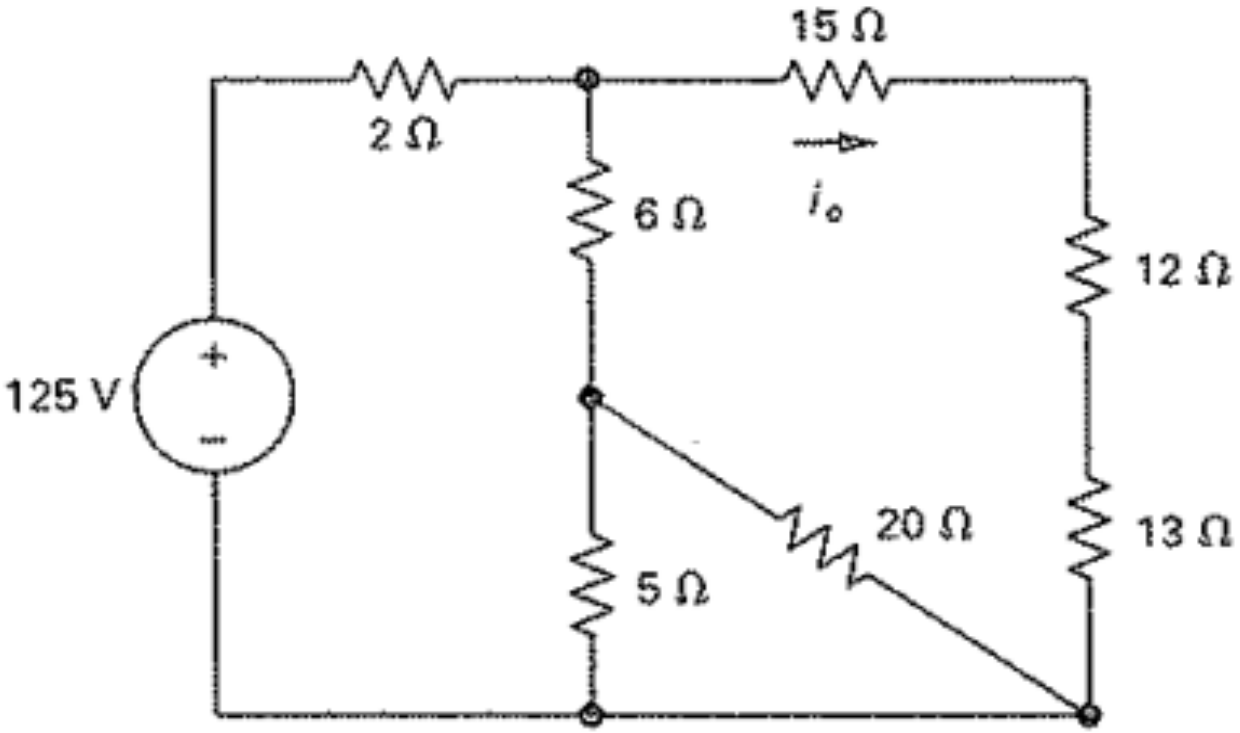
– 2 A, – 60 W

Example: given that the current in the 4 ohm resistor is 1.5 A going down, find the current and power of the dependent source



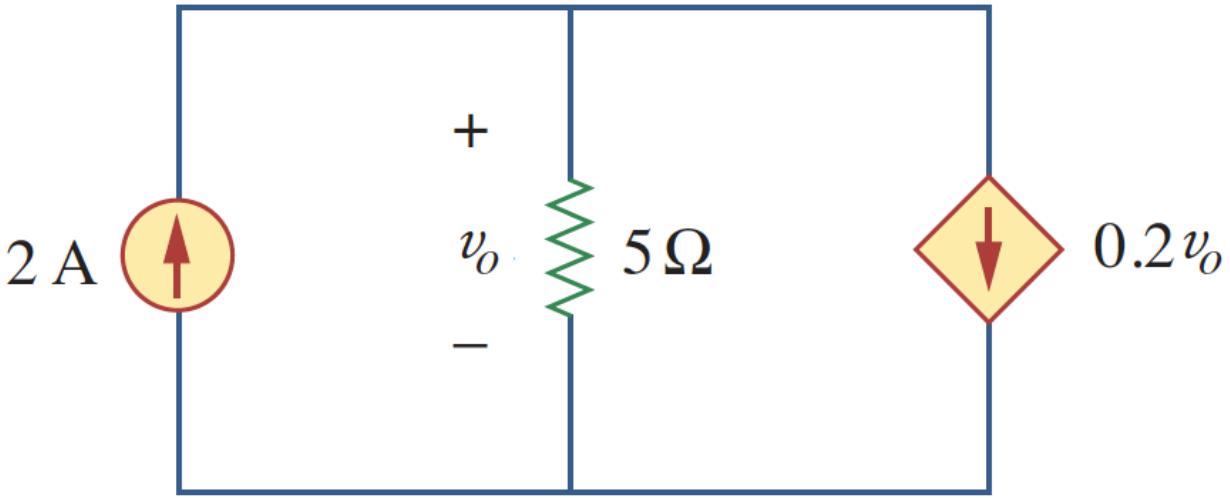
2.5 A

Practice problem: find i_o



$5\,V, 5\,W$

Practice problem: Find v_o and the power of the dependent source



$57\ V$

Practice problem: find v_o