

Desk copy

ECE 300
Short Test #3
Spring 2004

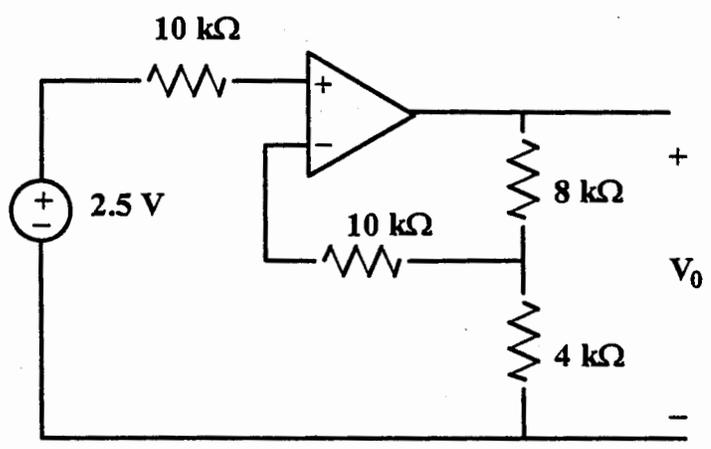
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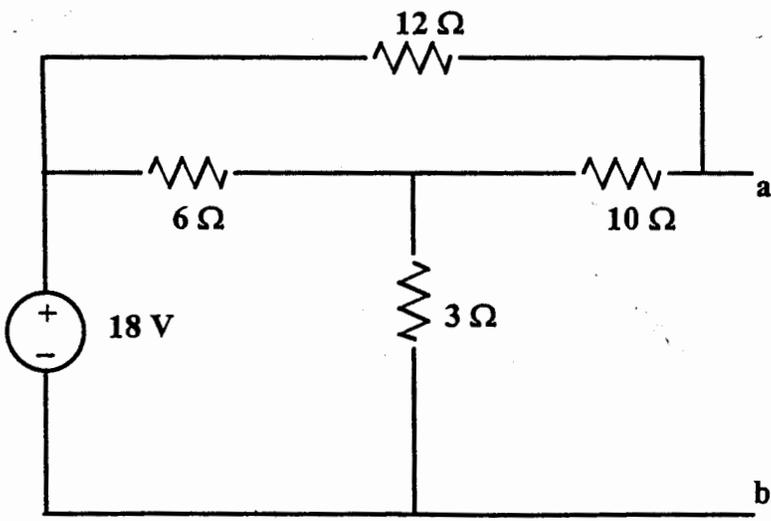
Each problem counts 15%. Do your work on engineering notebook paper. Attach this sheet to the front. Staple in top left hand corner.

(1) You are given the following op-amp circuit. Assume an ideal op-amp. Find V_0 .



(2) You are given the circuit below.

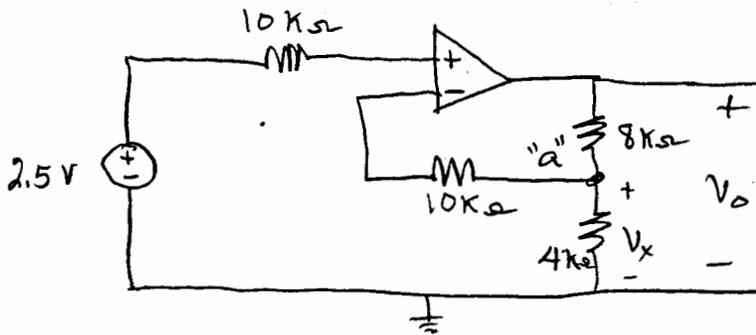
- (a) Find the Thevenin equivalent circuit looking to the left of points a-b.
- (b) Draw the Thevenin equivalent circuit.



Shop Test # 3

wleg

(1) For the circuit below, find V_o



By inspection, the voltage $V_x = 2.5V$. No current in either $10k\Omega$ resistor so the input voltage goes directly across the $4k\Omega$ resistor.

At point "a" nodal analysis is applied.

$$\frac{2.5}{4k} + \frac{2.5 - V_o}{8k} = 0$$

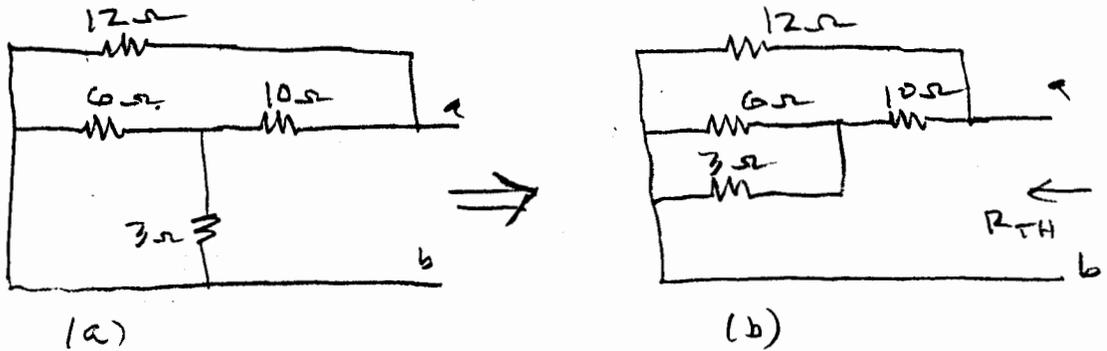
$$5 + 2.5 - V_o = 0$$

$$\therefore V_o = 7.5V$$

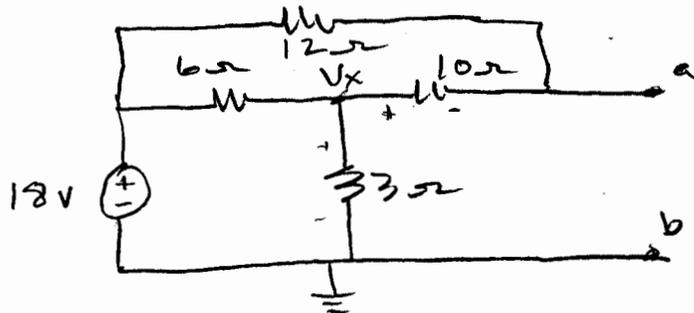
Wk 1

- (2) (a) Find the Thevenin equivalent circuit between a-b.
 (b) Draw the Thevenin

(a) First find R_{TH} (sources deactivated) ^{independent}



From (b) we see that $R_{TH} = 6 \Omega$
 Now find the open ckt voltage using Nodal



$$66 \frac{V_x - 18}{6} + \frac{V_x}{3} + \frac{V_x - 18}{22} = 0$$

$$11V_x - 198 + 22V_x + 3V_x - 54 = 0$$

$$36V_x = 252$$

$$V_x = 7V$$

$$V_{ab} = V_{TH} = V_x - 10 \left(\frac{V_x - 18}{22} \right) = \underline{\underline{12V}}$$

(b)



Thevenin's ckt