

# Exam #1 Results:

## Before Extra Credit:

Highest: 100 (2)

Lowest: 5

Average: 60.9

Median: 60

91-100 : 2

81-90 : 2

71-80 : 2

61-70 : 4

0-60 :  $\frac{18}{34}$

## After Extra Credit:

Highest: 120

Lowest: 10

Average: 79.5

Median: 85

91-120 : 9

81-90 : 5

71-80 : 3

61-70 : 1

0-60 :  $\frac{8}{26}$

Name

GRAND TOTAL = 276.00 GRAND AVERAGE = 76.46 % C

Homework Problem

TOTAL = 211.00 87.92 %

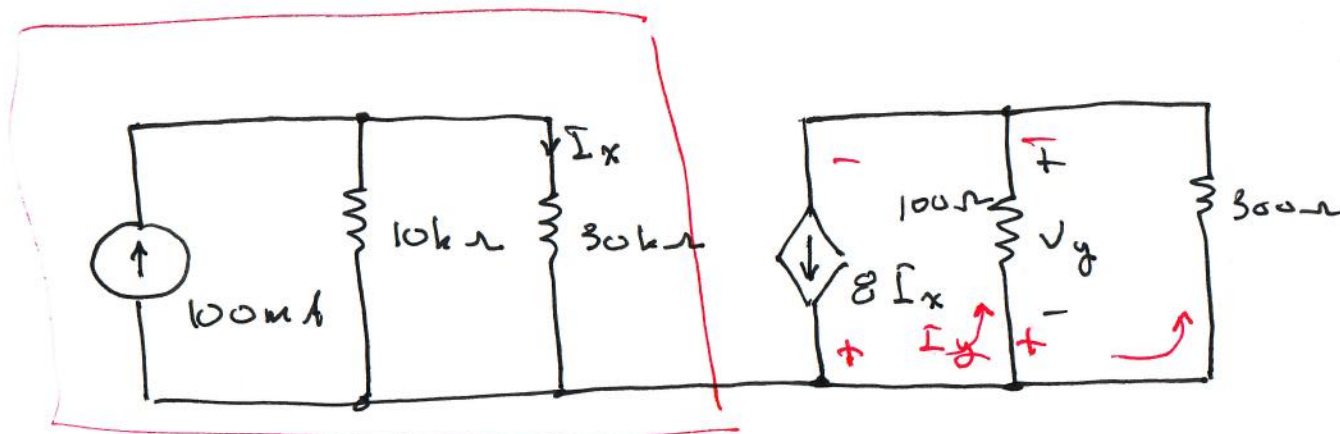
#001: 10	#002: 6	#003: 7	#004: 8	#005: 6	#006: 10	#007: 10
#008: 10	#009: 9	#010: 10	#011: 10	#012: 10	#013: 10	#014: 10
#015: 5	#016: 5	#017: 5	#018: 10	#019: 10	#020: 10	#021: 10
#022: 10	#023: 10	#024: 10				

Exam #1 Problem

TOTAL = 65.00 65.00 %

#001: 15	#002: 15	#003: 10	#004: 25	EC#001: NONE
EC#002: NONE	EC#003: NONE	EC#004: NONE		

Prob 29



a) Find  $V_y$

$$I_x = \frac{10k\Omega}{10k\Omega + 30k\Omega} \cdot 100mA = 25mA$$

$$8I_x = 200mA, \quad I_y = \frac{300}{300 + 100} \cdot 200mA = 150mA$$

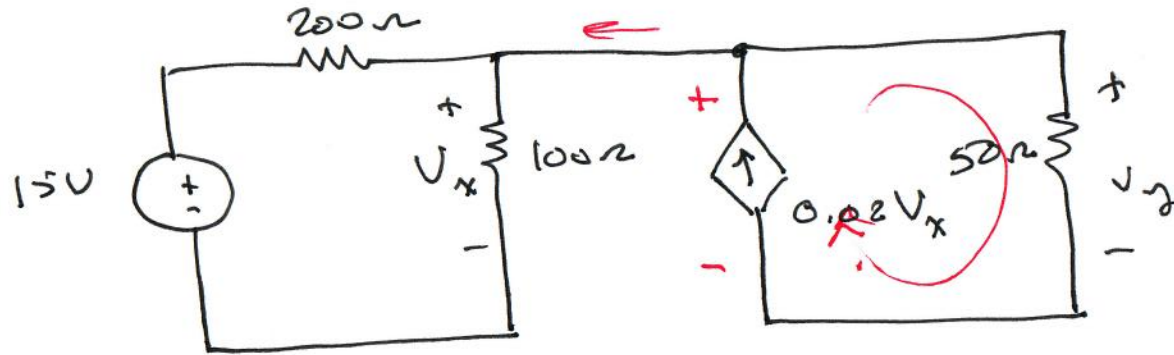
$$V_y = - (100\Omega) (I_y) = -15V$$

b) CCCS delivers or absorbs? How much?

Does not satisfy the PSC  $\Rightarrow$  delivers power

$$(200mA)(15V) = 3W$$

Prob. 30



a) Find  $V_2$

$$V_x = \frac{100}{200 + 100} \cdot 15V = 5V$$

$$0.02V_x = 0.1A \text{ or } 100mA$$

$$V_2 = (50\Omega)(0.02V_x) = 5V$$

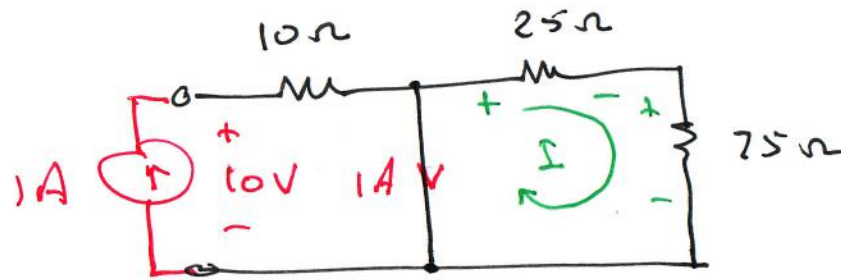
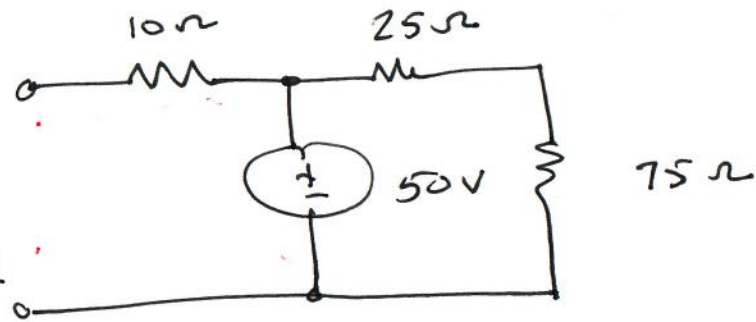
b) Does deliver or absorb? How much?

Does not satisfy the PSC  $\Rightarrow$  delivers power

$$(100mA)(5V) = 500mW \text{ or } 0.5W$$

Prob. 28

With the  
load resistor  
( $R_x$ ) removed

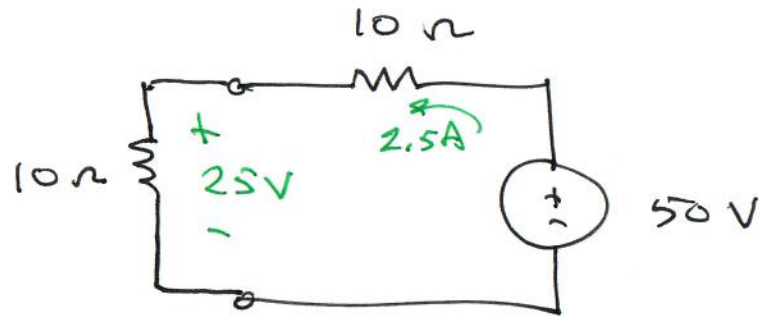


$$25I + 75I = 0$$

$$100I = 0 \Rightarrow I = 0$$

$$\Rightarrow R_T = 10 \Omega$$

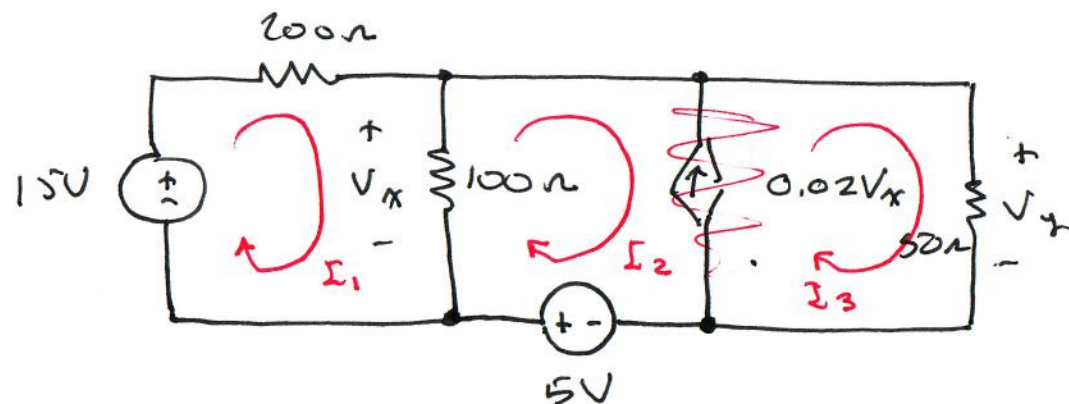
$$V_T = 50V$$



$$P = (25\text{V})(2.5\text{A}) = 62.5\text{W}$$

$$P = \frac{(25\text{V})^2}{10\ \Omega} = 62.5\text{W}$$

$$P = (2.5\text{A})^2 (10\ \Omega) = 62.5\text{W}$$



$$I_3 - I_2 = 0.02 V_x \quad (\text{constraint})$$

$$-15 + 200 I_1 + 100 (I_1 - I_2) = 0 \quad (\text{KVL for mesh 1})$$

$$100 (I_2 - I_1) + 50 I_3 - 5 = 0 \quad (\text{KVL for mesh 2,3})$$

$$V_x = 100 (I_1 - I_2) \quad (\text{definition})$$

$$\begin{bmatrix} 0 & -1 & 1 & -.02 \\ 300 & -100 & 0 & 0 \\ -100 & 100 & 50 & 0 \\ -100 & 100 & 0 & 1 \end{bmatrix} \begin{bmatrix} I_1 \\ I_2 \\ I_3 \\ V_x \end{bmatrix} = \begin{bmatrix} 0 \\ 15 \\ 5 \\ 0 \end{bmatrix}$$

$$I_1 = .0833 \dots A$$

$$I_2 = .1 A$$

$$I_3 = .0666 \dots A$$

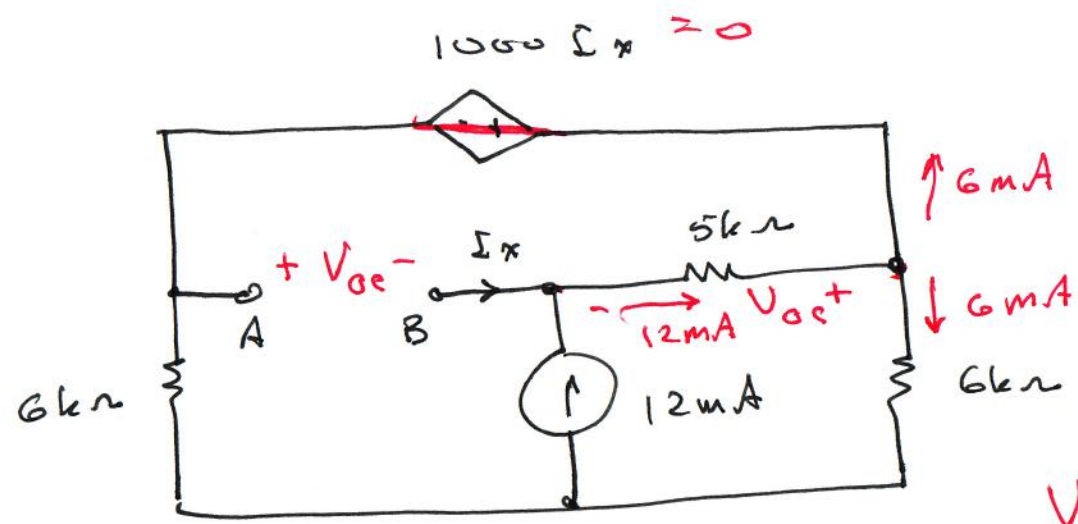
$$V_x = -1.6666 \dots V$$

$$V_g = 50 I_3 = \frac{2}{3} \times 10^{-1} \cdot 50 = \frac{10}{3} V$$

absorbs

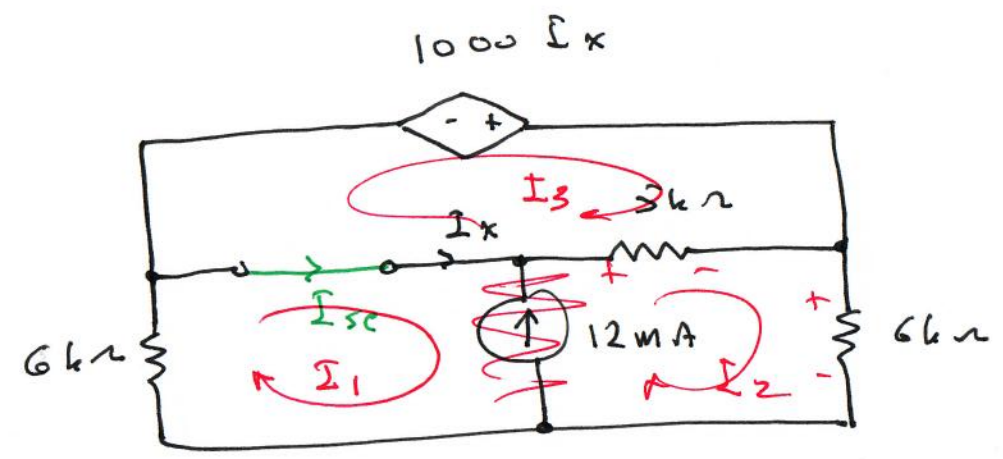
$$P = (.02 V_x) V_g = 0.02 \left( +\frac{2}{3} \right) \left( \frac{10}{3} \right) = \frac{1}{9} W$$





$$V_{oc} = - (5k\Omega) (12mA)$$

$$= -60V$$



$$I_2 - I_1 = 12mA \quad (\text{constraint})$$

$$(6k\Omega) I_1 + (5k\Omega) (I_2 - I_3) + (6k\Omega) I_2 = 0$$

$$-100\Omega I_x + (5k\Omega) (I_3 - I_2) = 0 \quad (\text{KVL for sm})$$

$$(\text{KVL for mesh 3})$$

$$I_x = I_1 - I_3$$