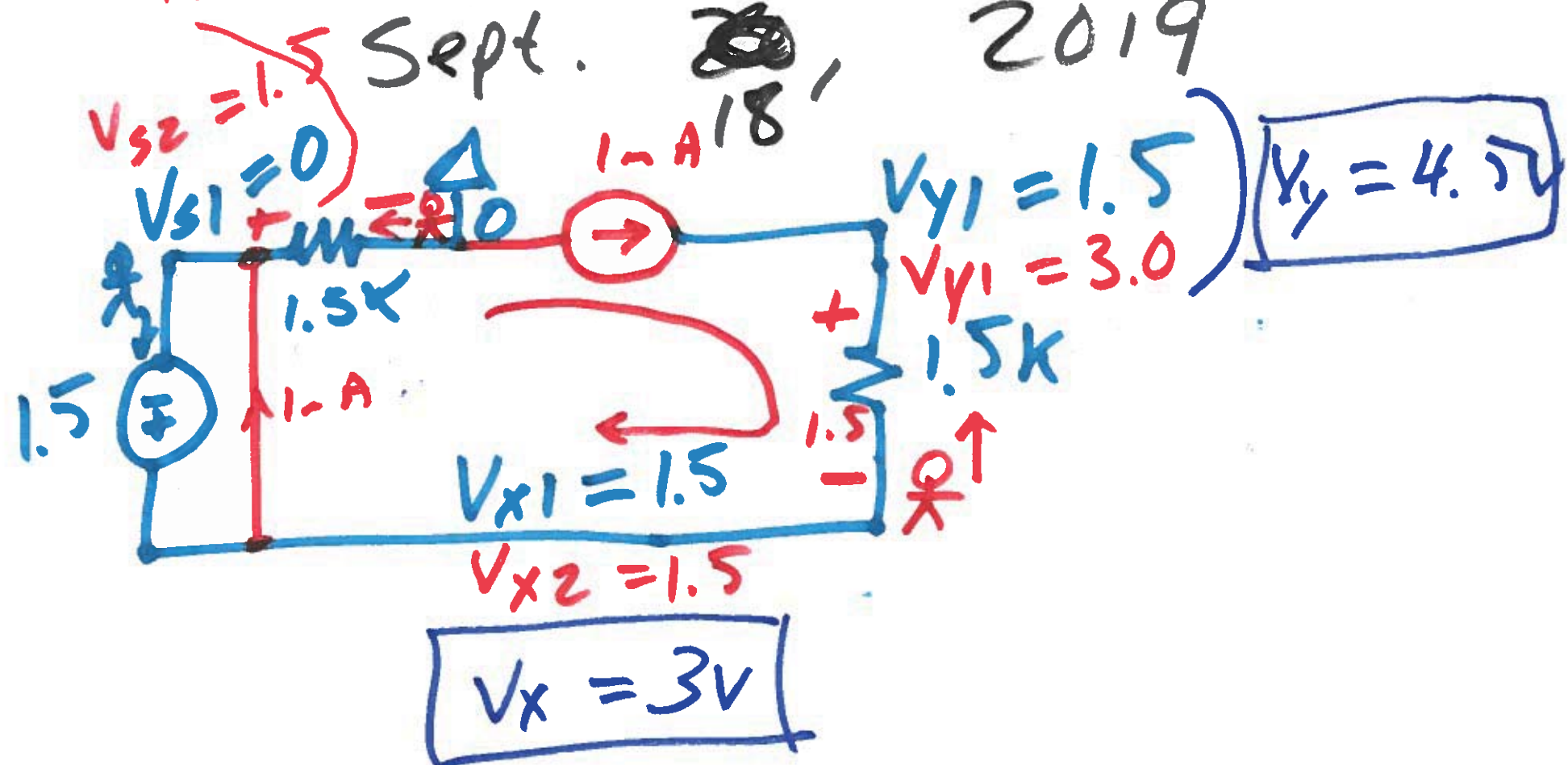


EE 220 Circuits I

Lecture 7

Sept. 18, 2019

$$V_s = 1.5$$



1)

Quiz #5 EE 220 Fall 2019 Name: _____

Closed book and notes.

Show your work for credit! Put boxes around your answers.

1. Find the voltages, V_s , V_x , and V_y in the following circuit. (5 point)

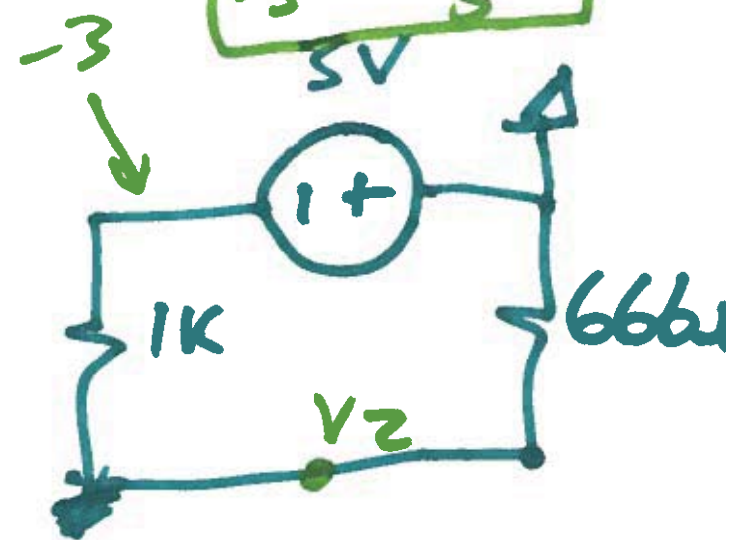
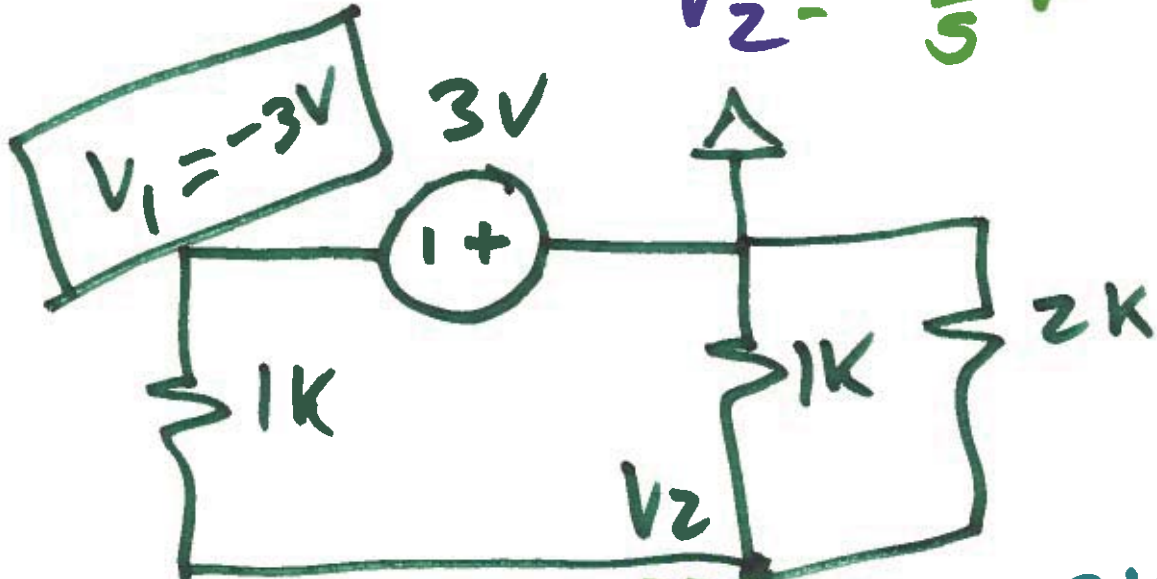
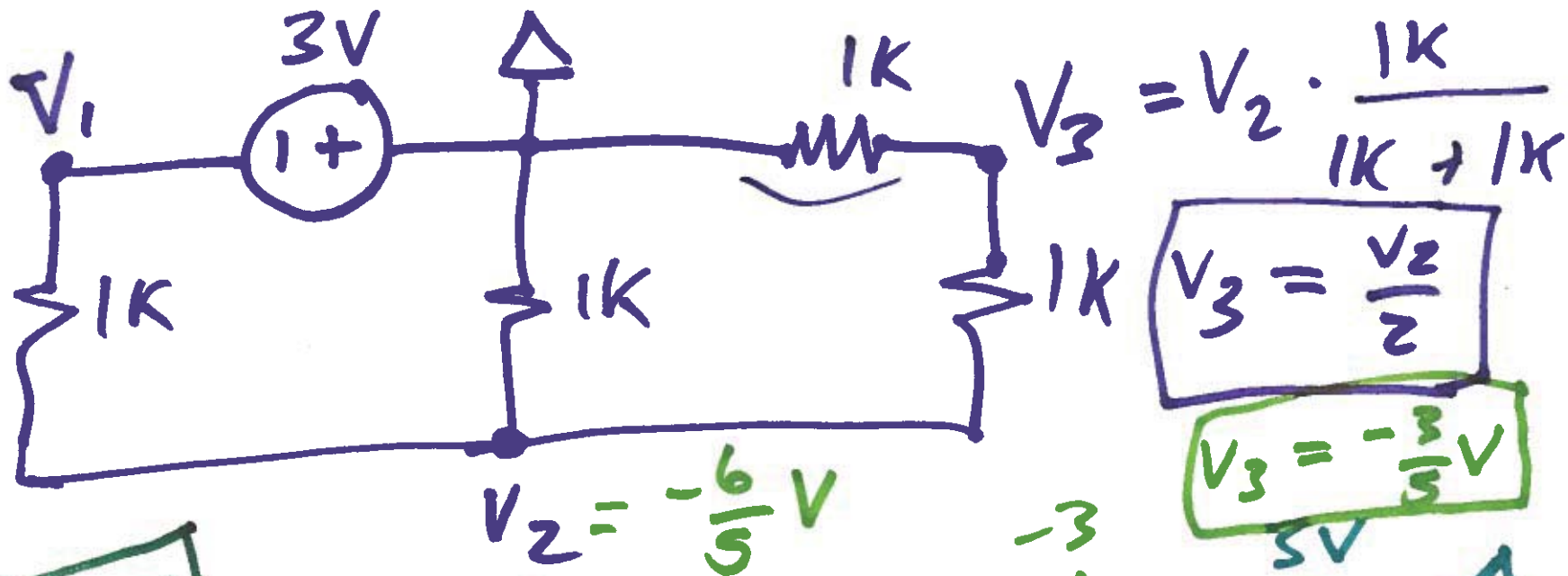


$$1.5 + 1.5 = V_x = 3V$$

$$3 + 1.5 = V_y = 4.5V$$

$$V_s = 1.5V$$

2/

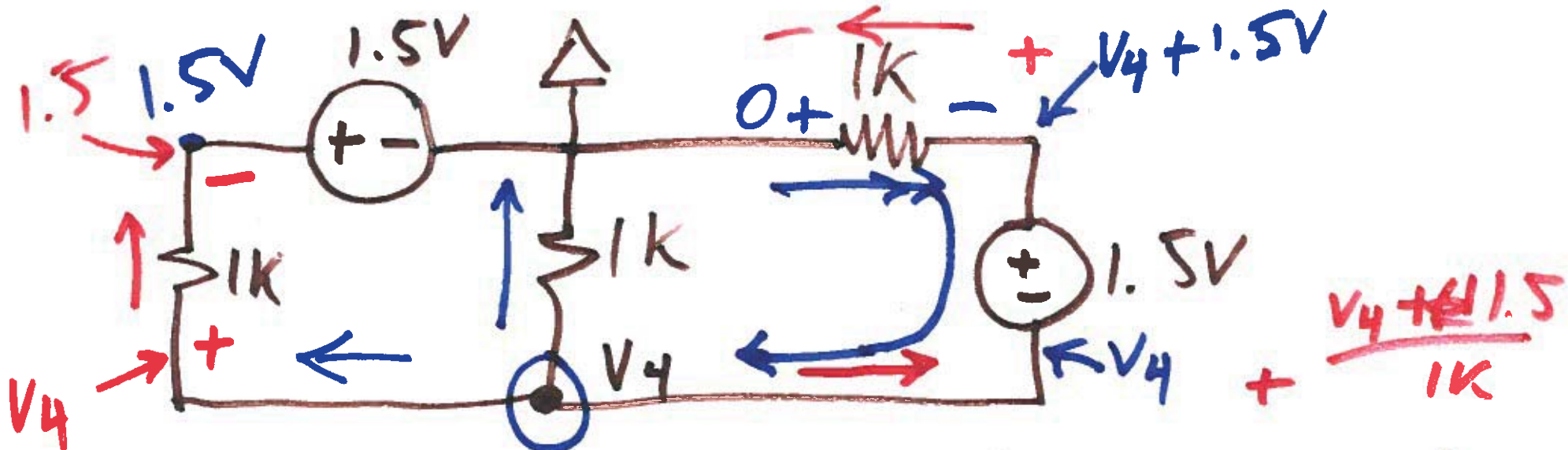


$$V_2 = -3 \cdot \frac{2 \cdot 333}{5 \cdot 333} = \frac{1k \cdot 2k}{1k + 2k} = 666$$

$$V_2 = -3 \cdot \frac{666}{1k + 666}$$

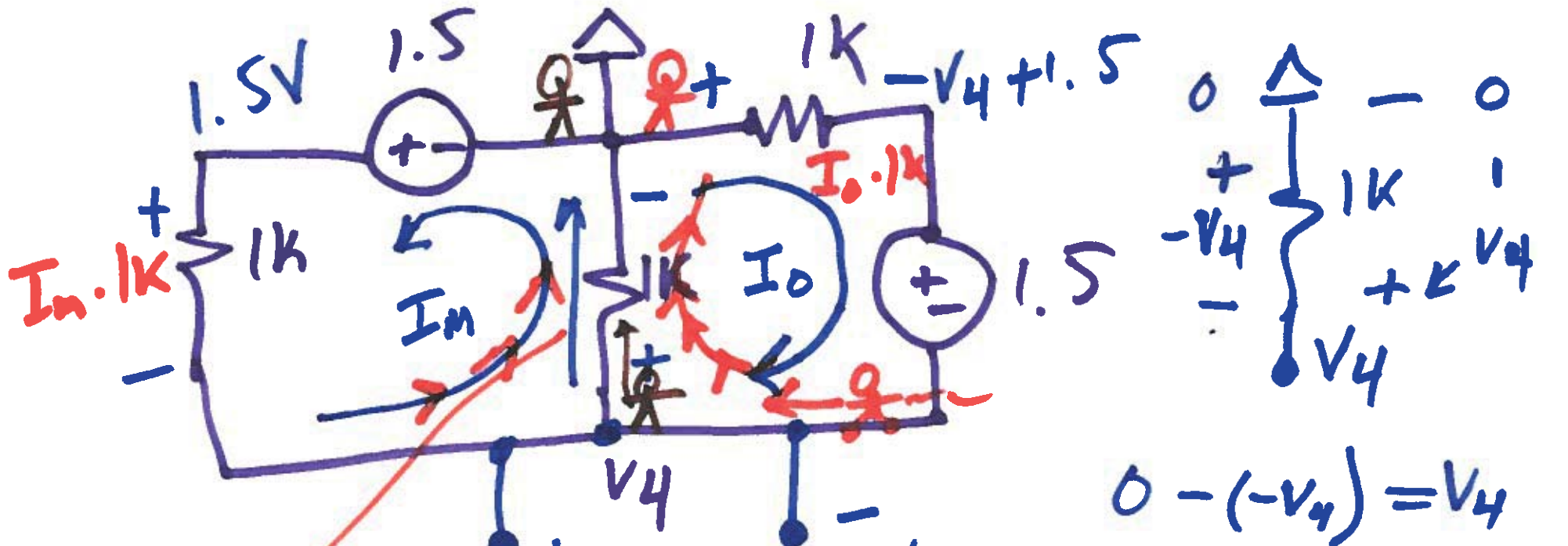
$$V_2 = -\frac{6}{5}V$$

3)



$$\frac{V_4}{1k} + \frac{V_4 - 1.5}{1k} - \frac{0 - (V_4 + 1.5)}{1k} = 0$$

4)



$$V_4 = (I_m + I_o) \cdot 1k$$

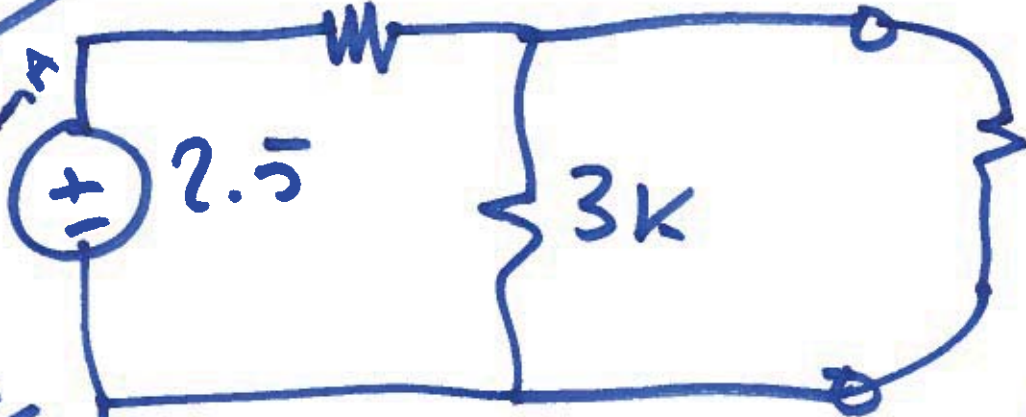
$$\textcircled{M} 1.5 - I_m \cdot 1k - V_4 = 0$$

$$\textcircled{O} (I_m + I_o) 1k - I_o \cdot 1k - 1.5 = 0$$

5)

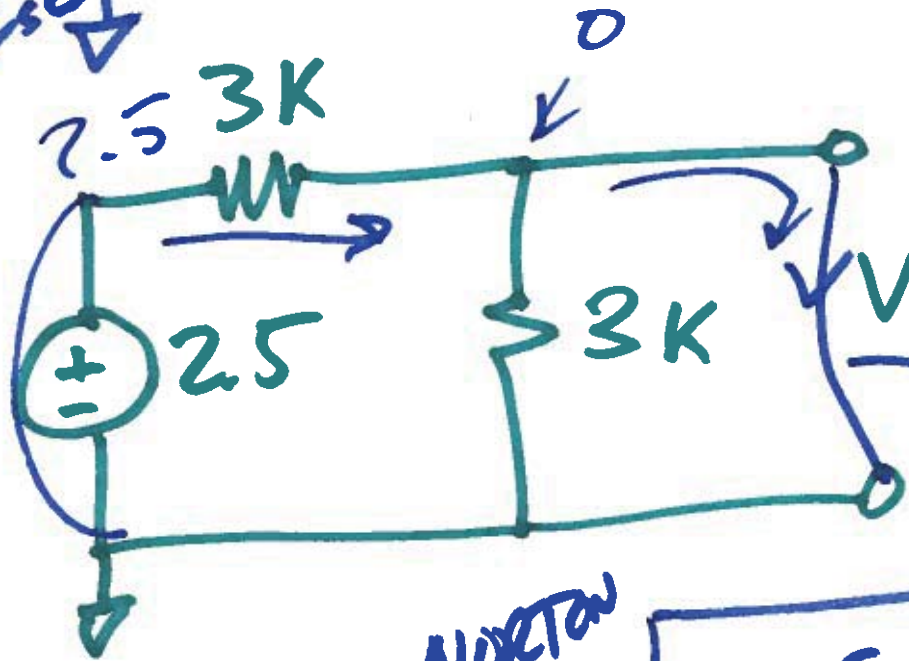
$\frac{1.25}{\frac{2.5}{3}} = \frac{3}{2} \text{ k}$

$V_{OVT} = 2.5 \cdot \frac{1.5 \text{ k}}{1.5 \text{ k} + 3 \text{ k}}$



$V_{OVT} = \frac{2.5}{3} \text{ V}$

$R_{TH} = \frac{V_{OC}}{I_{SC}}$

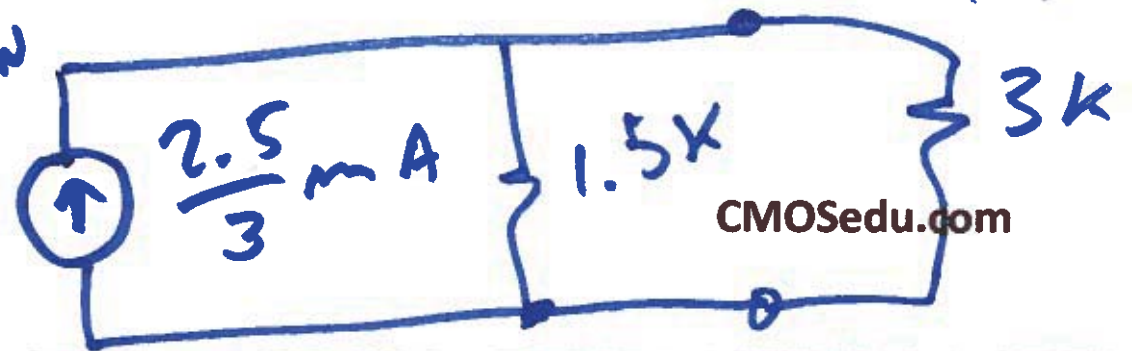


$V_{OC} = V_{TH} = 1.25$

$I_{SC} = \frac{2.5 - 0}{3 \text{ k}}$



NORTON

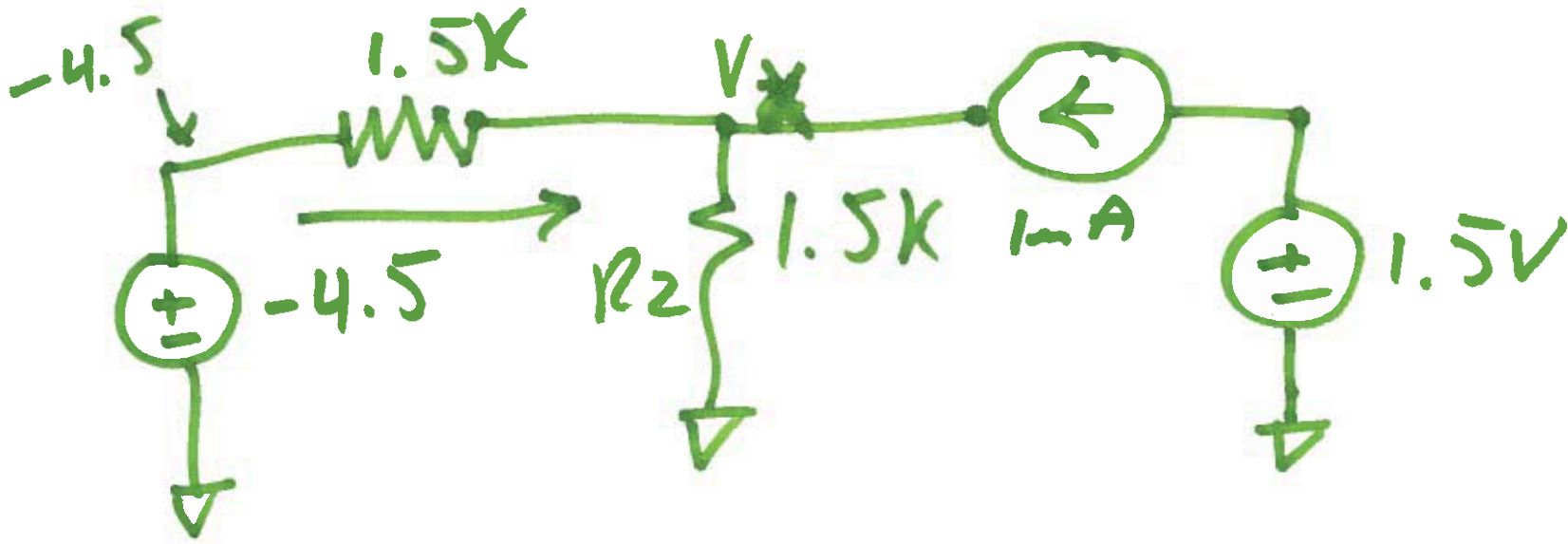


6)

$$V_{out} = \frac{2.5}{3}$$

$$1.25 \cdot \frac{3k}{3k + 1.5k} = V_{out}$$

$$= 1.25 \cdot \frac{2 \cdot 1.5k}{3 \cdot 1.5k}$$

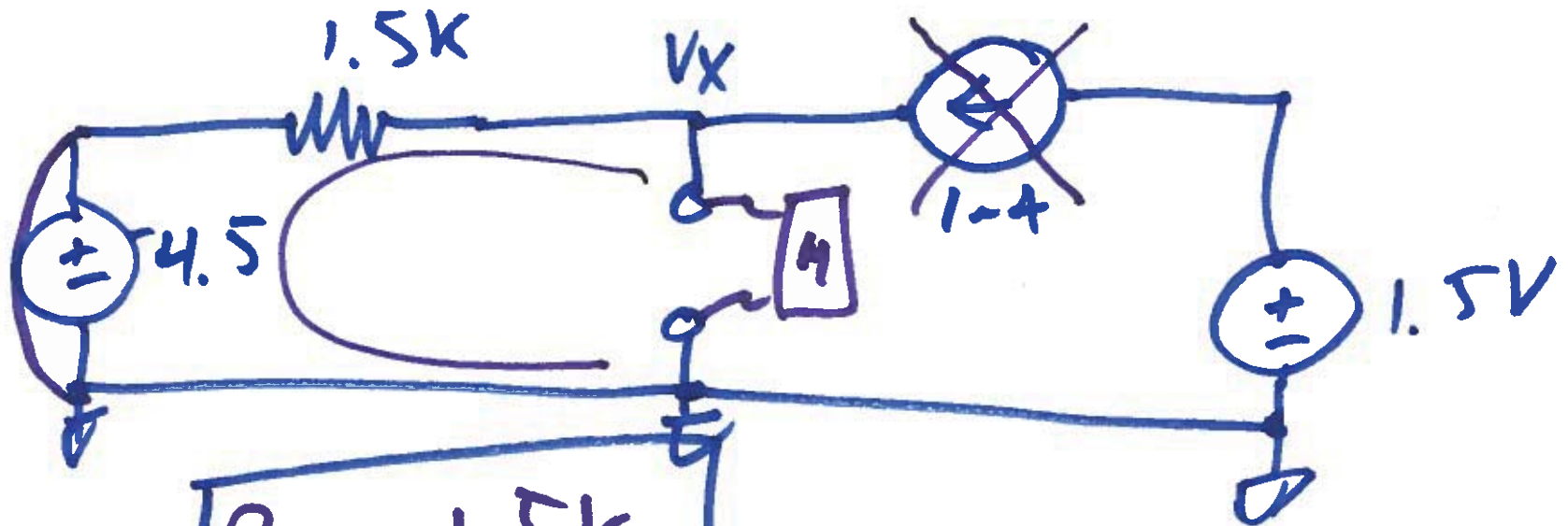


$$+ \left(\frac{-4.5 - V_x}{1.5K} \right) - \frac{V_x}{R_2 1.5K} + 1mA = 0$$

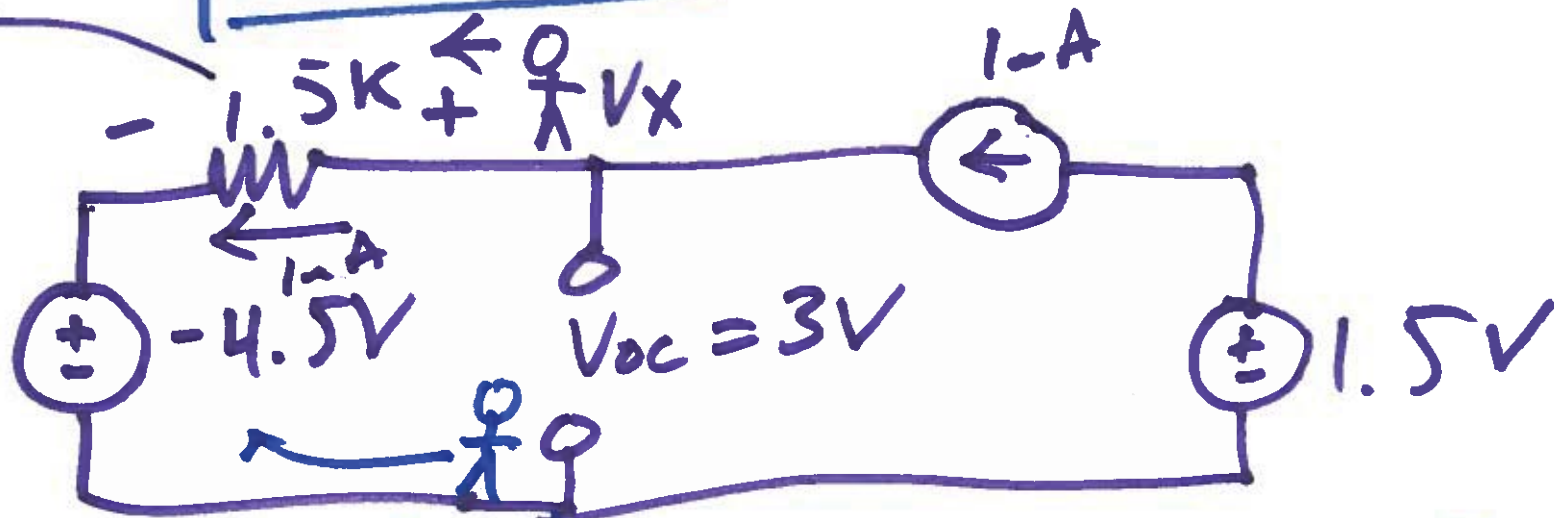
$$-4.5 - V_x - V_x + 1.5V = 0$$

$$-2V_x = 3V$$

$$V_x = -1.5V$$



$R_{TH} = 1.5k$

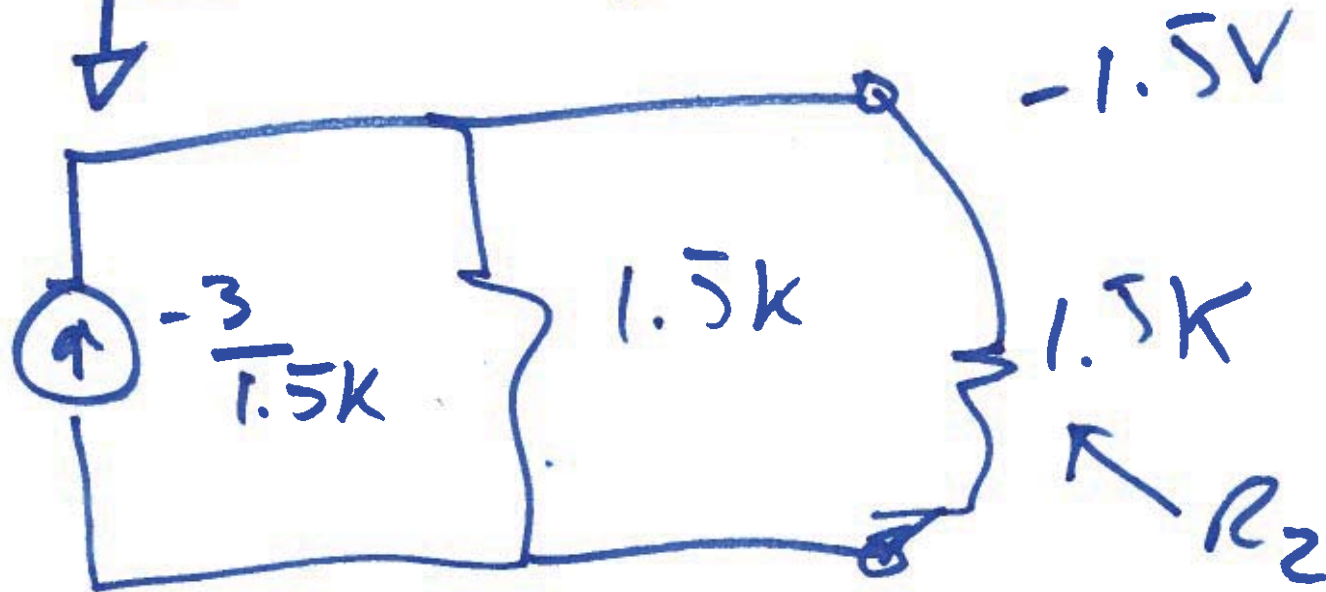
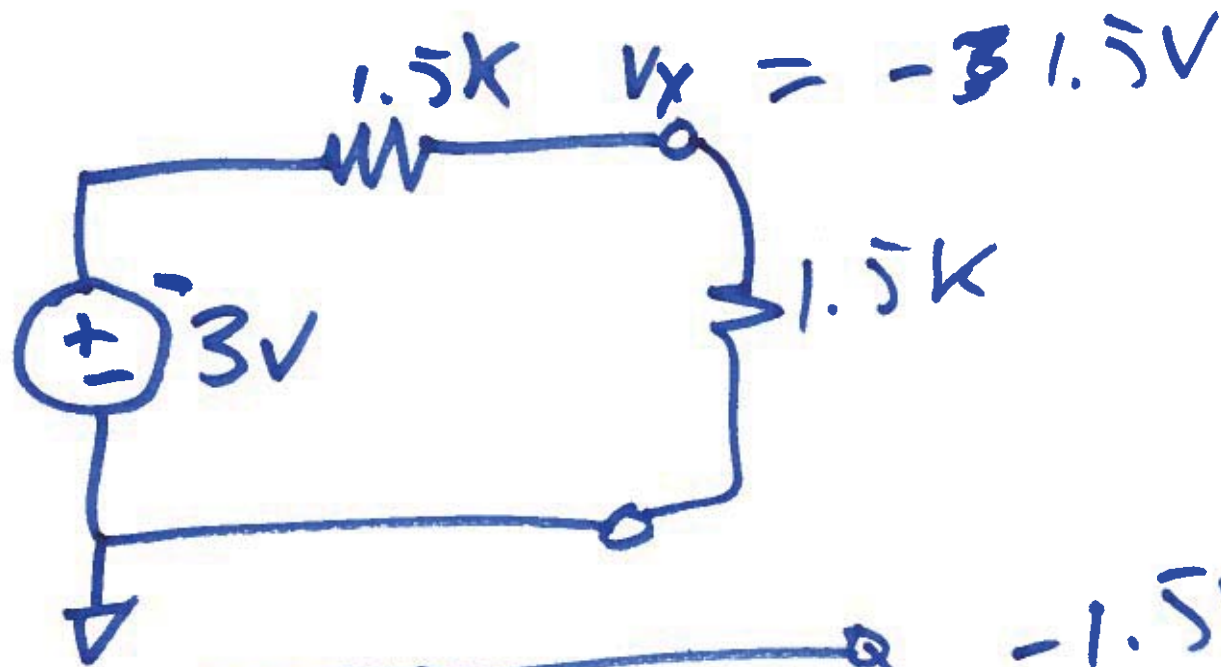


$-4.5 + 1.5 = -3$

$V_x = -1.5 - (-4.5) = 3V$

$V_{TH} = 3V$

9)



10)