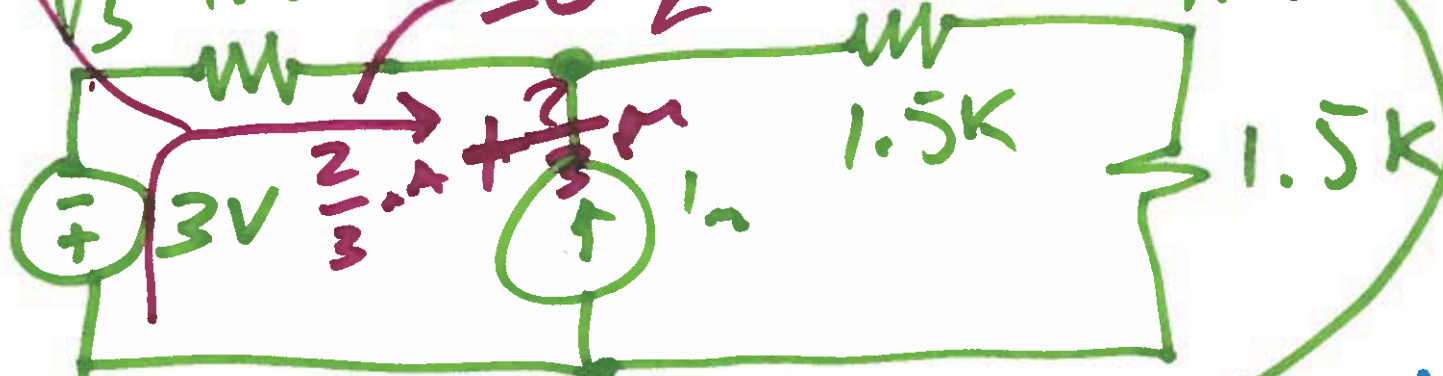


EE 220 Circuits 1

9/11/2019

Lecture 5

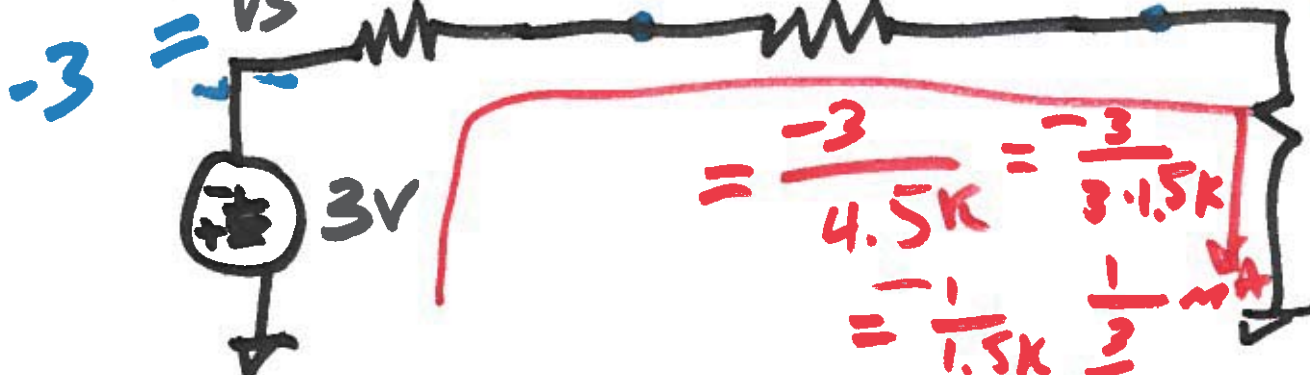
$4/3 \text{ mA}$
 $V_s = -9V$
 $1.5K$



$$V_y = \frac{-3 \cdot 1.5K}{1.5K + 1.5K + 1.5K}$$

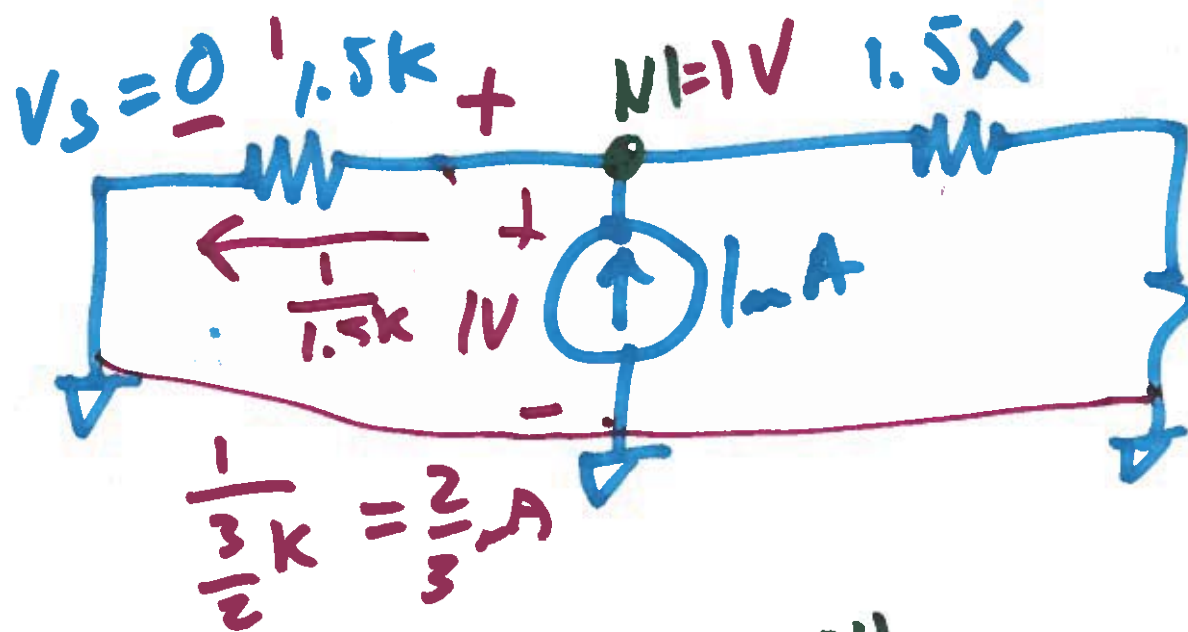
$$V_x = -1 + \frac{1}{2} = \underline{\underline{-1V}}$$
$$= \underline{\underline{-\frac{1}{2}V}}$$

$-3 = V_s$
 $1.5K$
 0.2
 $1.5K$
 -1
 $V_x = -1V$



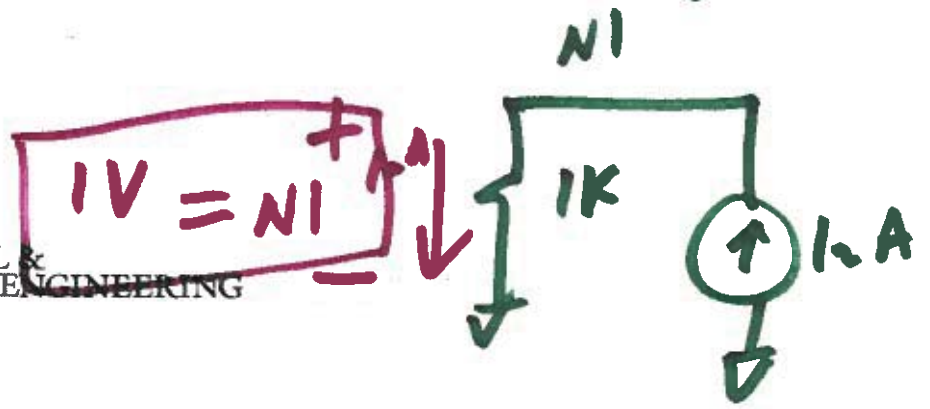
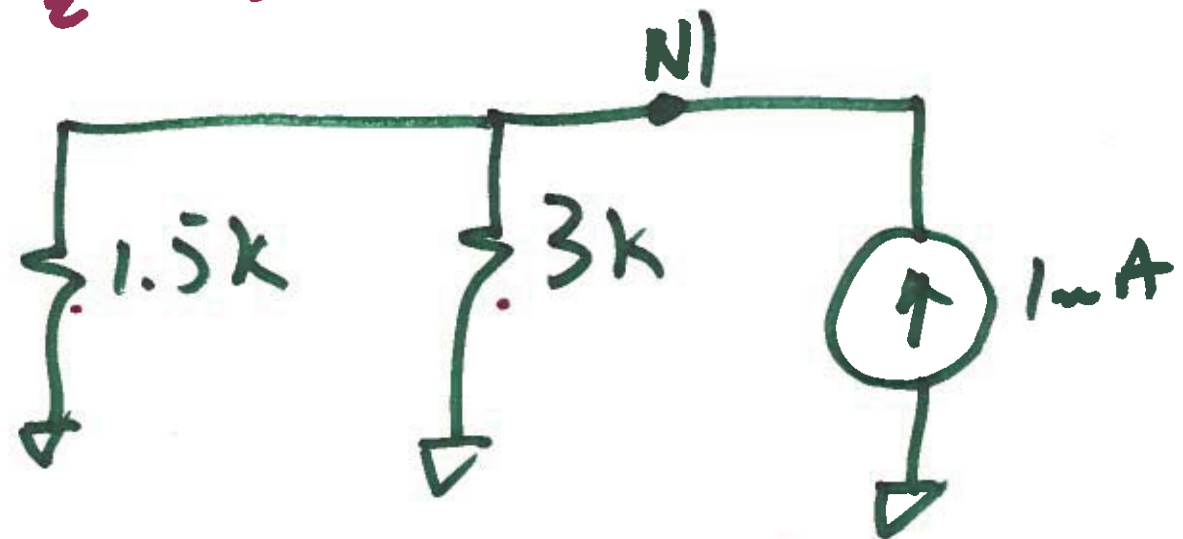
$$= \frac{-3}{4.5K} = \frac{-3}{3 \cdot 1.5K}$$
$$= \frac{-1}{1.5K} = \frac{1}{\frac{3}{2}} \text{ mA}$$
$$= \frac{2}{3} \text{ mA}$$

$$V_x = I \cdot 1.5K$$
$$= \frac{-2}{3} \text{ mA} \cdot \frac{3}{2} K$$
$$\boxed{= -1V}$$

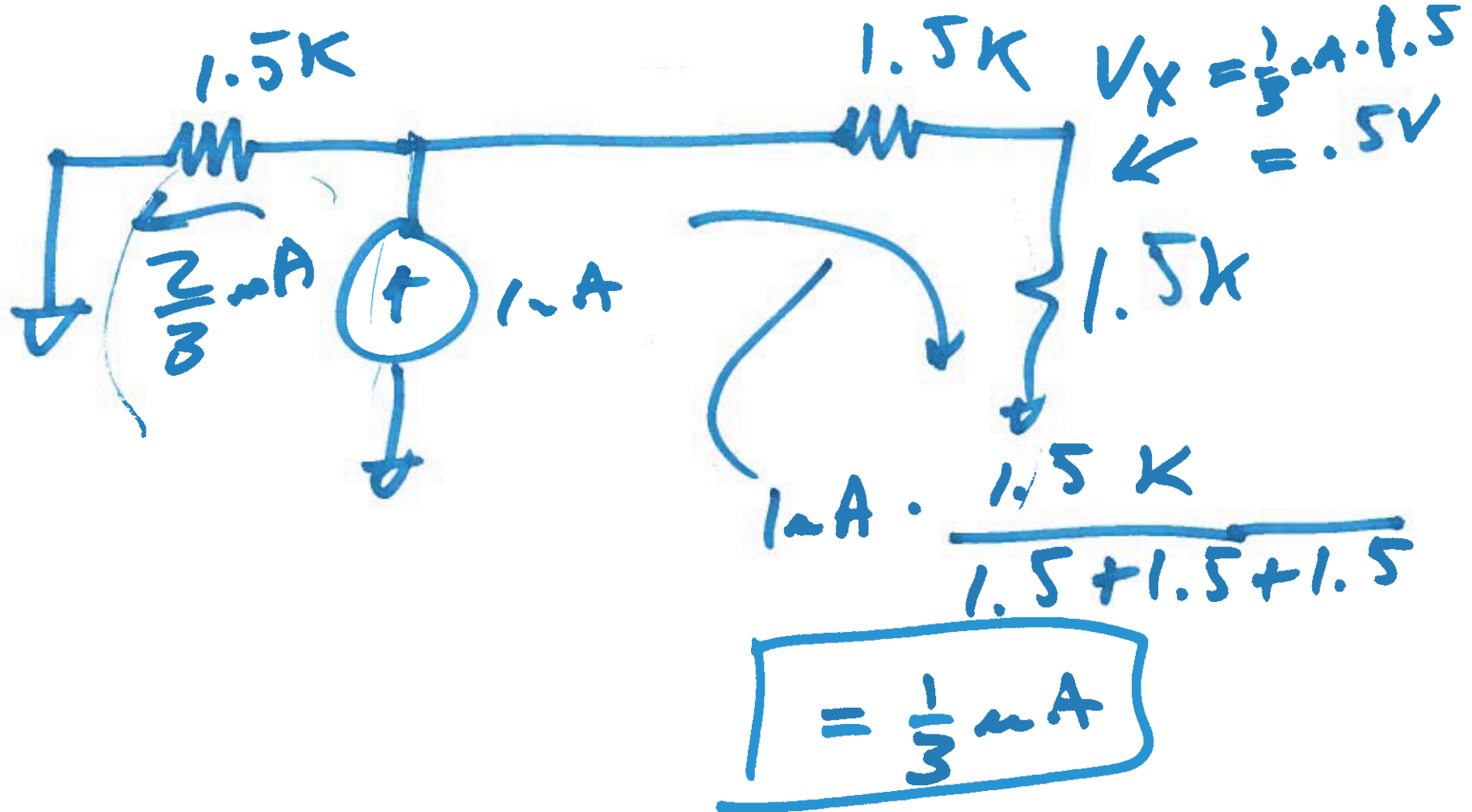


$V_x = \frac{1}{2} V$
 $1.5k \frac{1}{2} = 1 \cdot \frac{1.5}{1.5 + 1.5}$

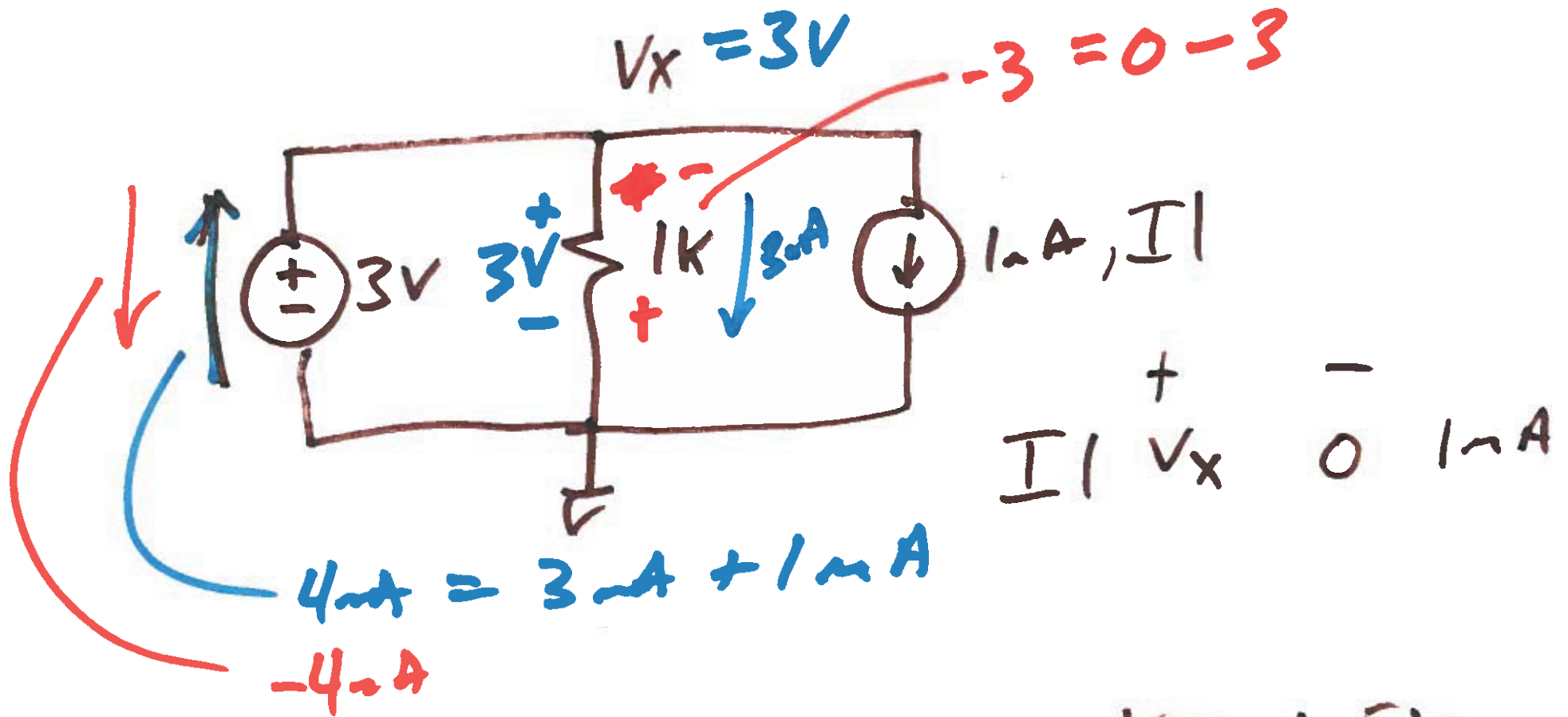
$\frac{3 \cdot 1.5}{3 + 1.5} k$
 $1k = \frac{4.5}{4.5} k$



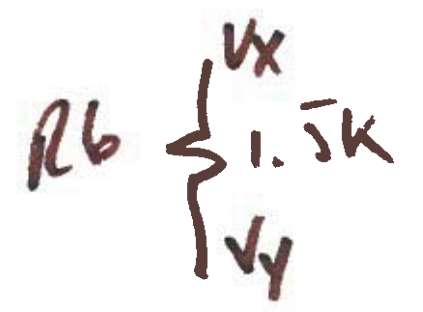
2)



3)



	+	-	
I	V_x	0	$1mA$



R_b	V_x	V_y	$1.5k$
R_b	V_y	V_x	$1.5k$

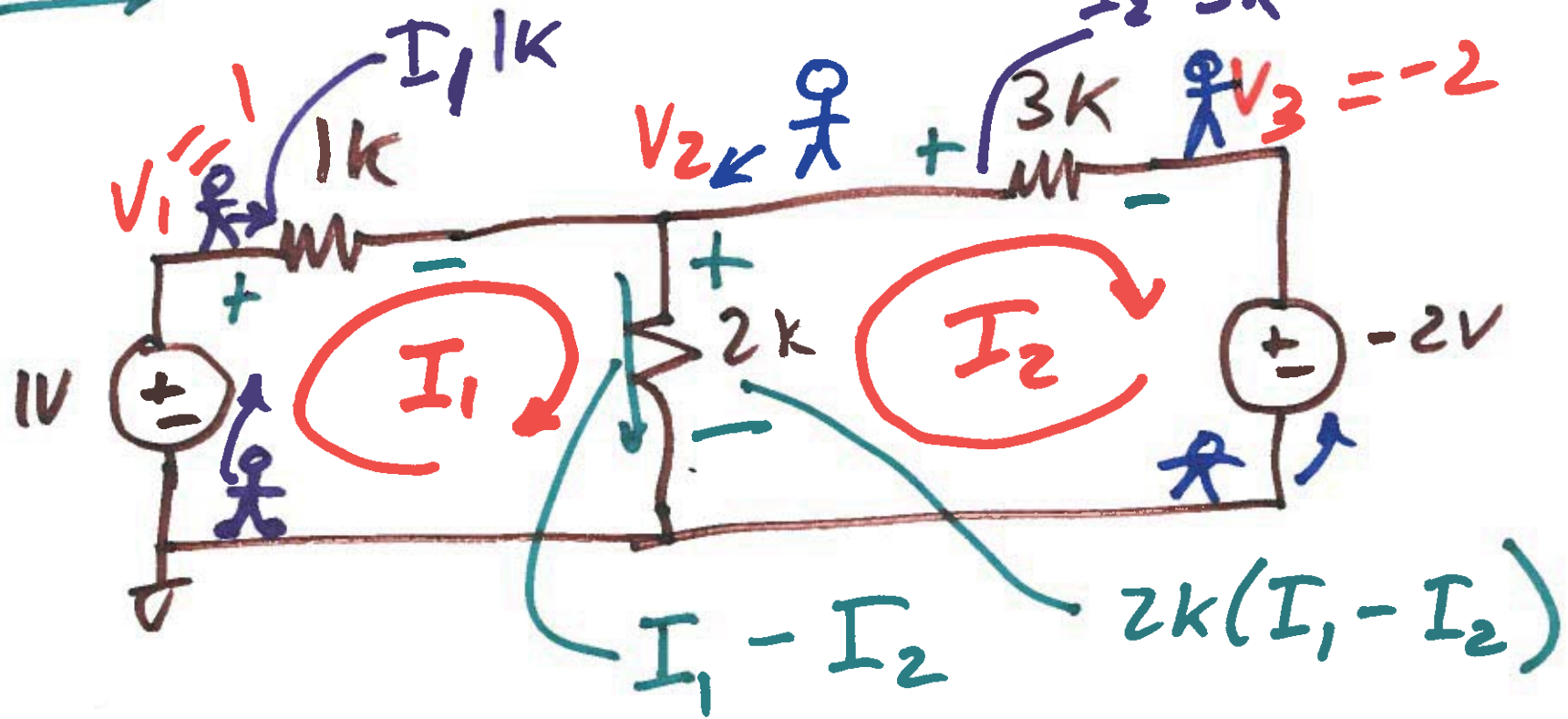
4)

my netlist

R2	Vx	0	3k
R1	Vx	Vs	3k
Vs	Vs	0	DC 1.5
R3	Vs	Vy	2k
I1	Vz	0	1mA
R4	Vy	Vz	6k
R5	Vy	Vz	6k
R6	Vy	Vz	6k

input
and

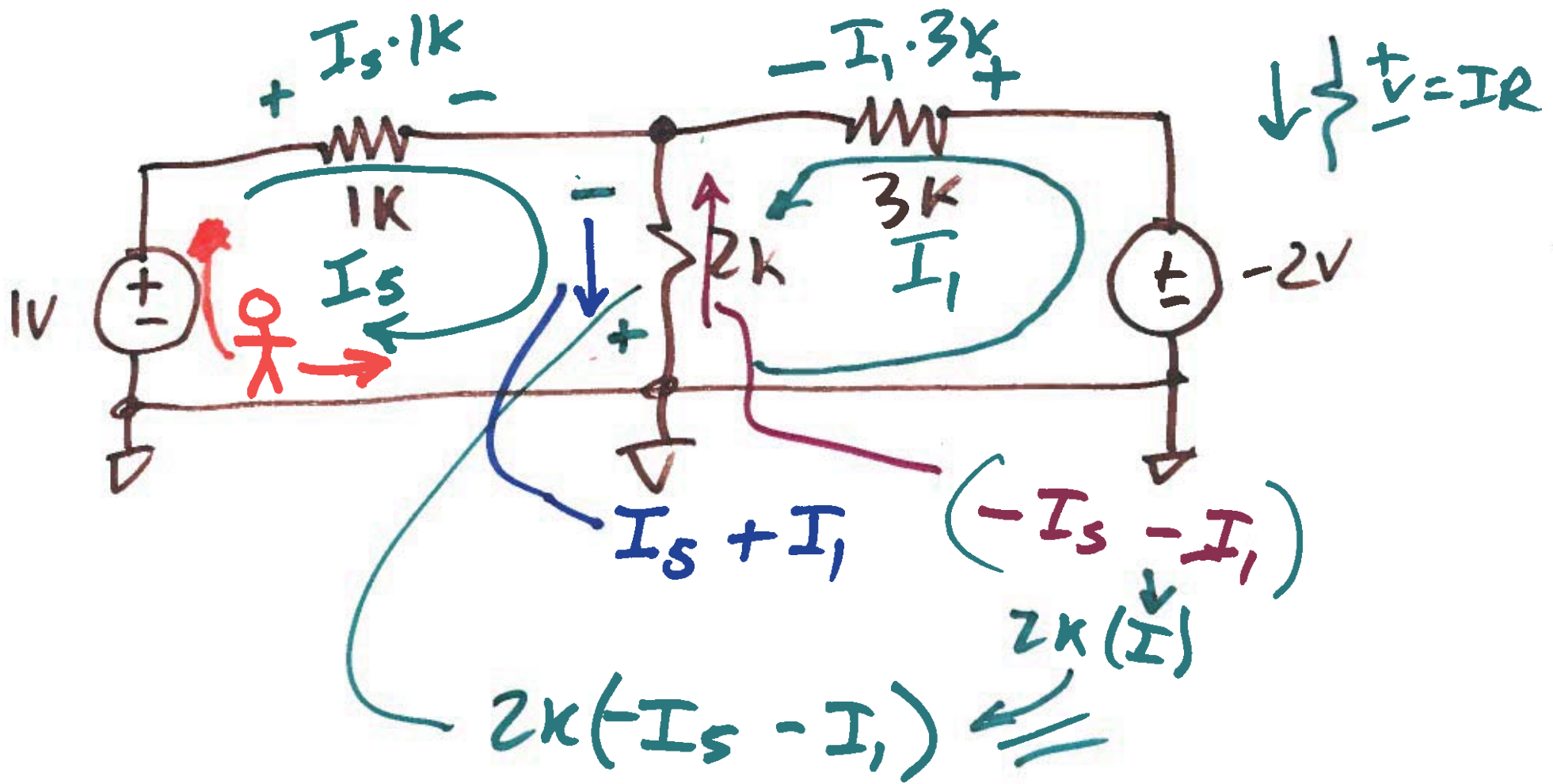
MESH ANALYSIS $v = IR$



$$4V - I_1 \cdot 1k - 2k(I_1 - I_2) = 0$$

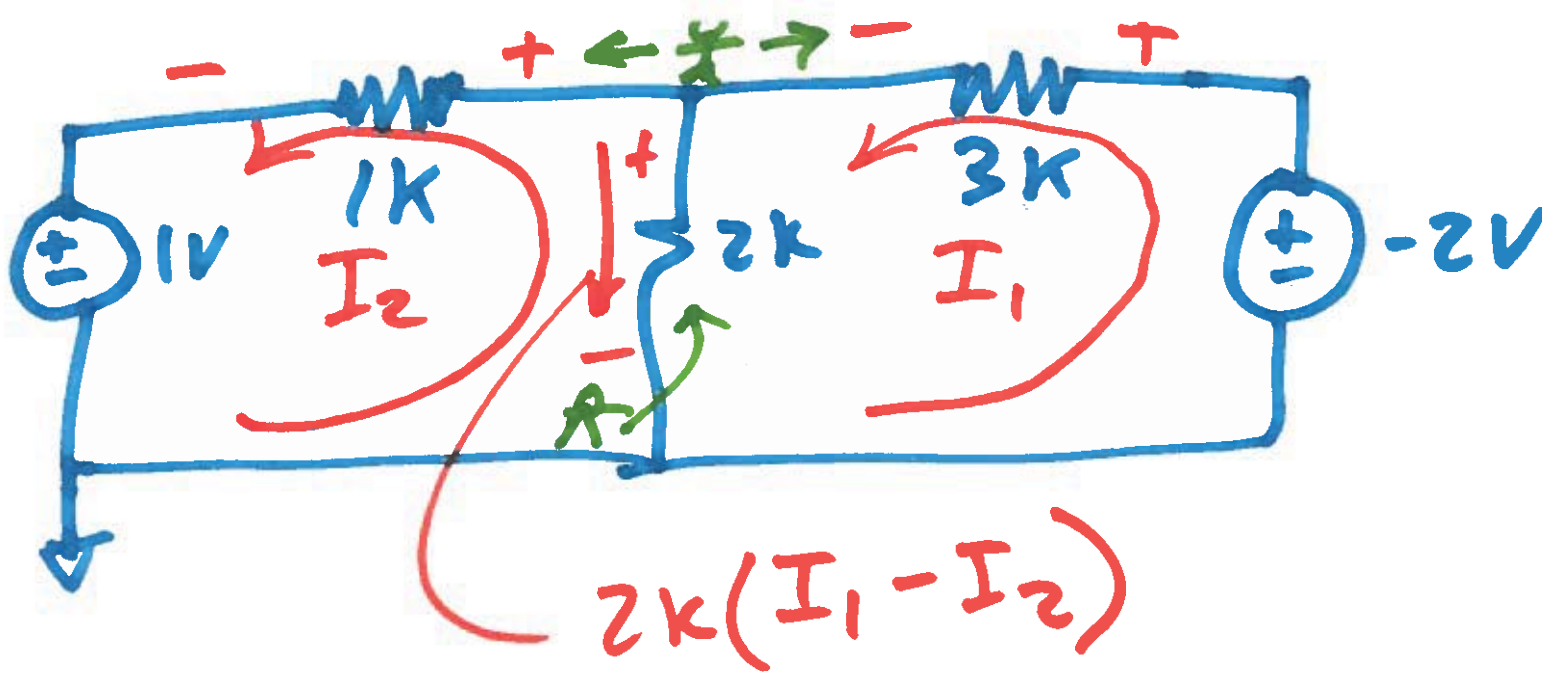
$$-2k(I_1 - I_2) + (-2V) + I_2 \cdot 3k = 0$$

o)



$$-2k(-I_s - I_1)$$

7)



$$-1k \cdot I_2 - 1V + 2k(I_1 - I_2) = 0$$

$$3k \cdot I_1 - (-2V) + 2k(I_1 - I_2) = 0$$

$$\div \text{ by } (-1k) \rightarrow I_2 + 1mA - 2I_1 + 2I_2 = 0$$

$$\div \text{ by } 2k \rightarrow 1.5I_1 + 1mA + I_1 - I_2 = 0$$

$$-2I_1 + 3I_2 + 1mA = 0$$

$$2.5I_1 - I_2 + 1mA = 0$$

$$+2I_1 = 3I_2 + 1 \mu\text{A}$$

$$I_1 = 1.5I_2 + \frac{1}{2} \mu\text{A}$$

$$2.5 \left(1.5I_2 + \frac{1}{2} \mu\text{A} \right) - I_2 + 1 \mu\text{A} = 0$$

$$3.75I_2 + 1.25 \mu\text{A} - I_2 + 1 \mu\text{A} = 0$$

$$2.75I_2 = -2.25 \mu\text{A}$$

$$= \frac{-2.25 \mu\text{A}}{2.75}$$

$$I_2 = \frac{-2.25 \mu\text{A}}{2.75}$$

$$= \frac{-9.025}{11 \cdot 0.25}$$

$$= \frac{-9.025}{2.75}$$

$$I_2 = -\frac{9}{11} \mu\text{A}$$

a)