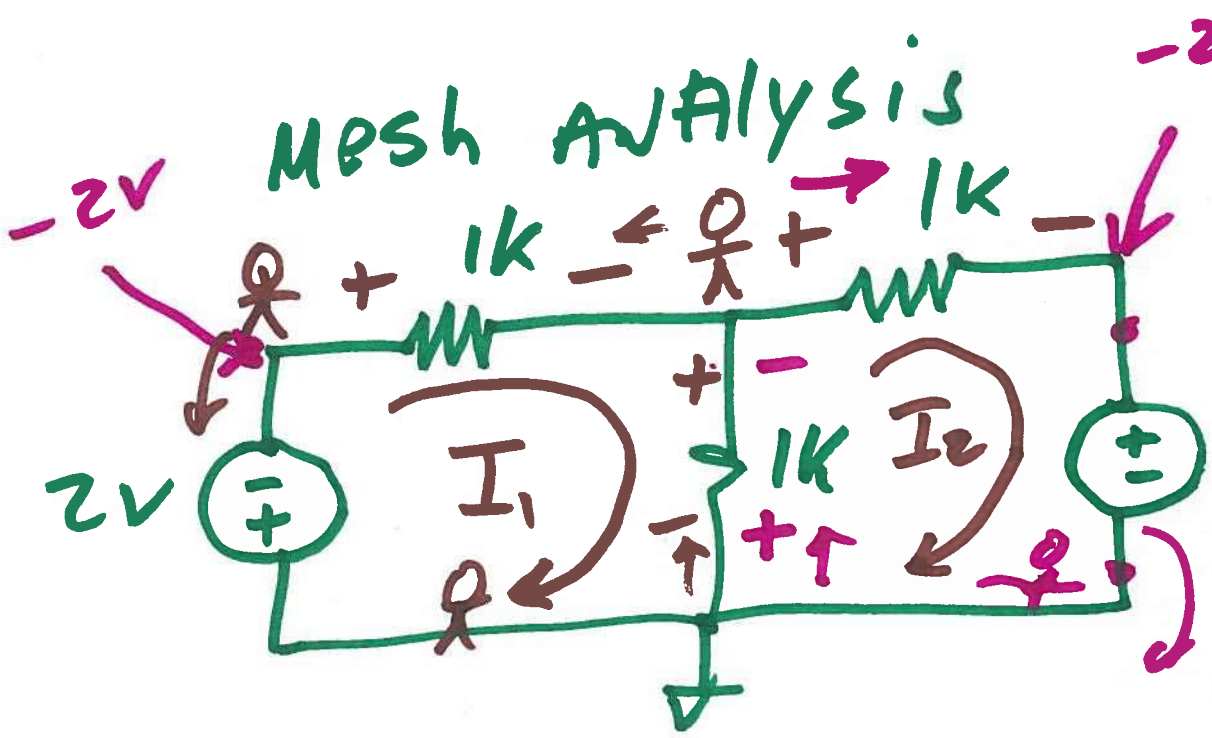
EE 221
circuits 1 1

Lecture 2

Jan. 28, 2019

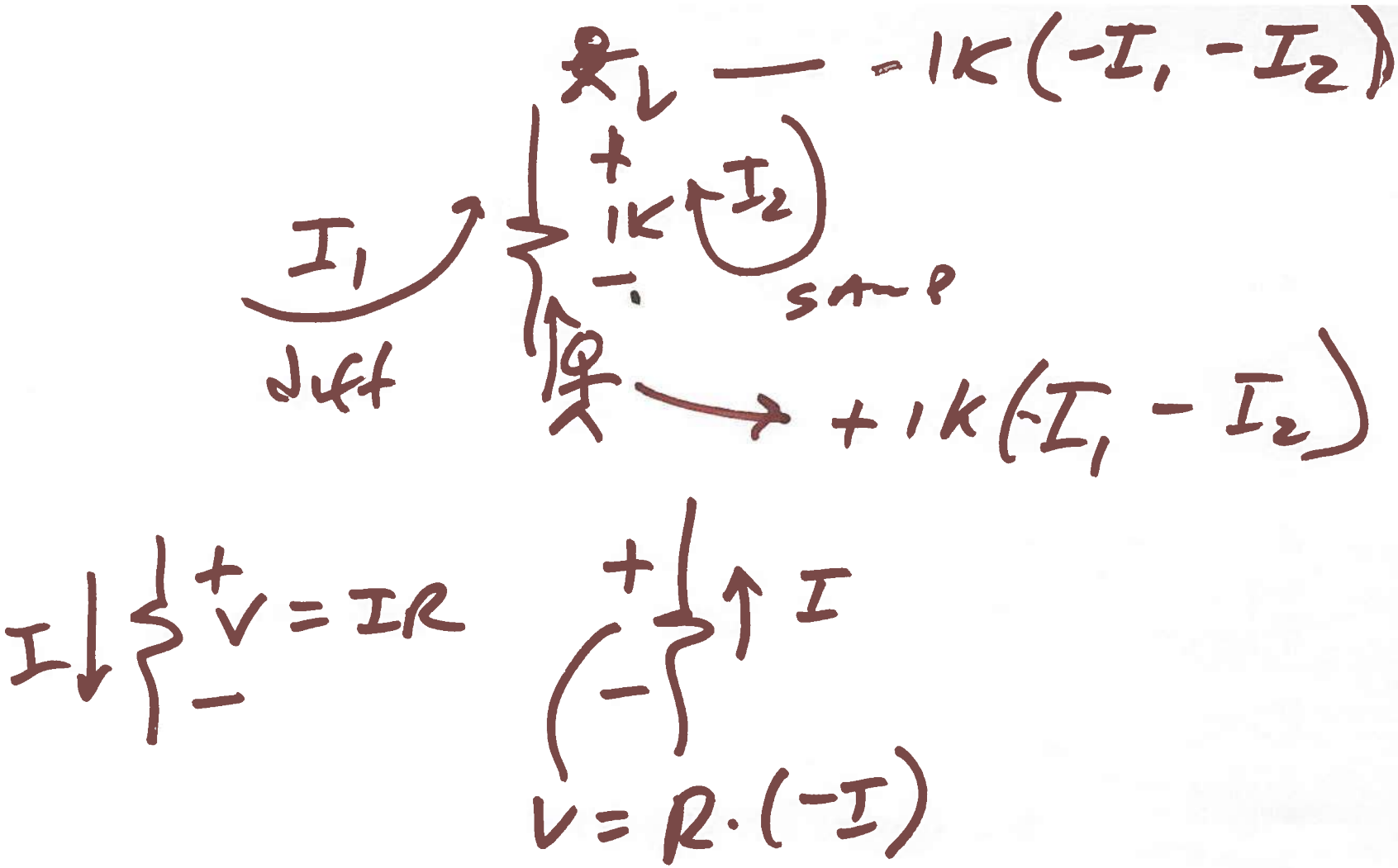


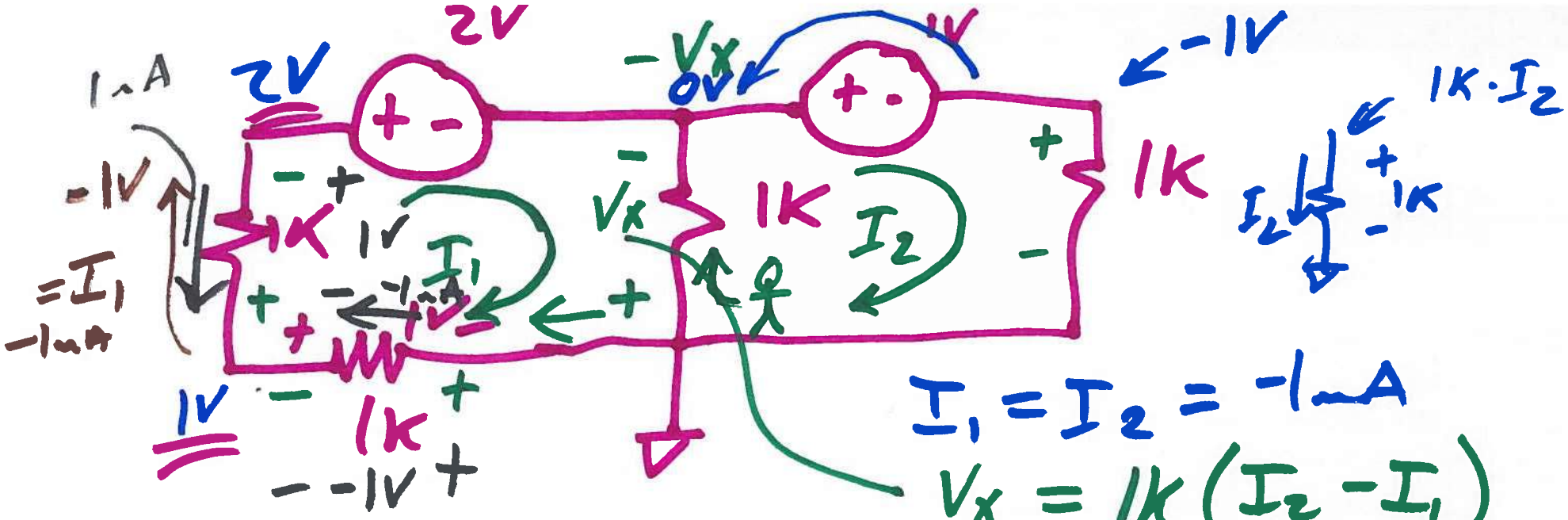
$$-1K(I_2-I_1)$$

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

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

$$-1K(I_2-I_1)$$


$-1K(-I_1 - I_2)$
+
$1K(-I_2)$
−
I_1
left
same
$+1K(-I_1 - I_2)$
I
+
$V = IR$
−
+
I
−
$V = R \cdot (-I)$



$I_1 = I_2 = -1mA$

$V_x = 1k(I_2 - I_1)$

$-1k \cdot I_1 - 1kI_1 - 2V + V_x = 0$

$-V_x - 1V - 1kI_2 = 0$

$-2kI_1 - 2 + 1k(I_2 - I_1) = 0$

$-3kI_1 - 2 + 1kI_2 = 0$

$I_2 = 2mA + 3I_1$

$$1K(I_1 - I_2) - 1 - 1KI_2 = 0$$

$$1KI_1 - 2K I_2 - 1 = 0$$

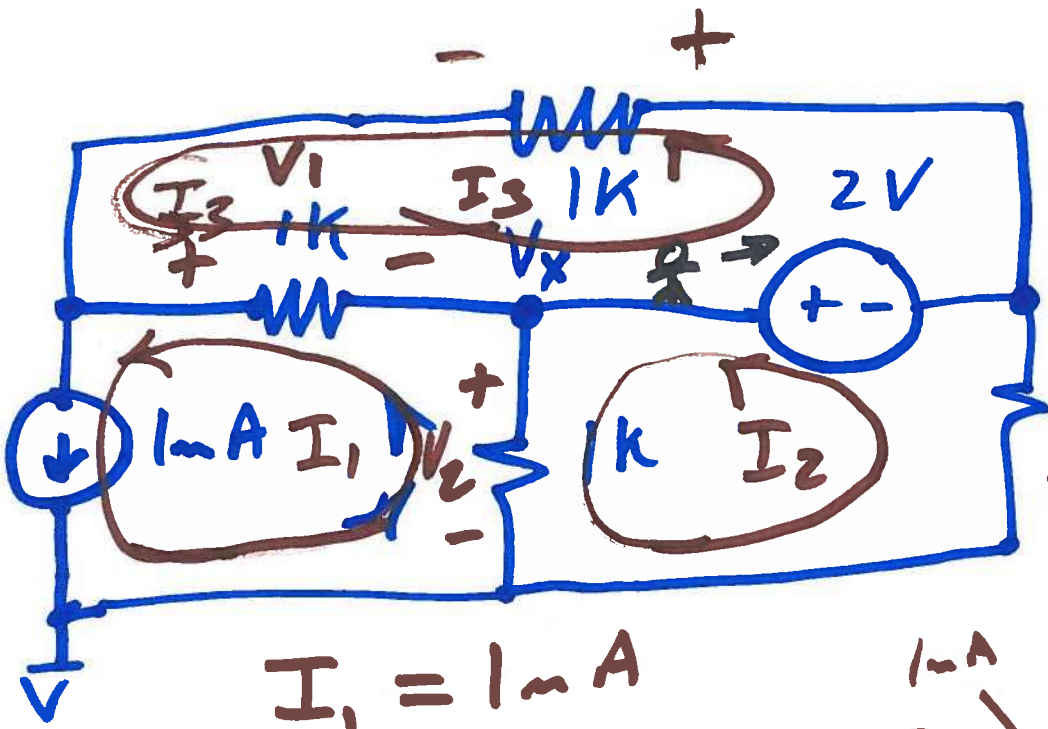
$$1KI_1 - 2(2 + 3KI_1) - 1 = 0$$

$$1KI_1 - 4 - 6KI_1 - 1 = 0$$

$$-5KI_1 = 5$$

$$\boxed{I_1 = -1\,mA}$$

$$\boxed{I_2 = -1\,mA}$$



$I_1 = 1mA$

$V_1 = 1K(I_3 - I_1)$

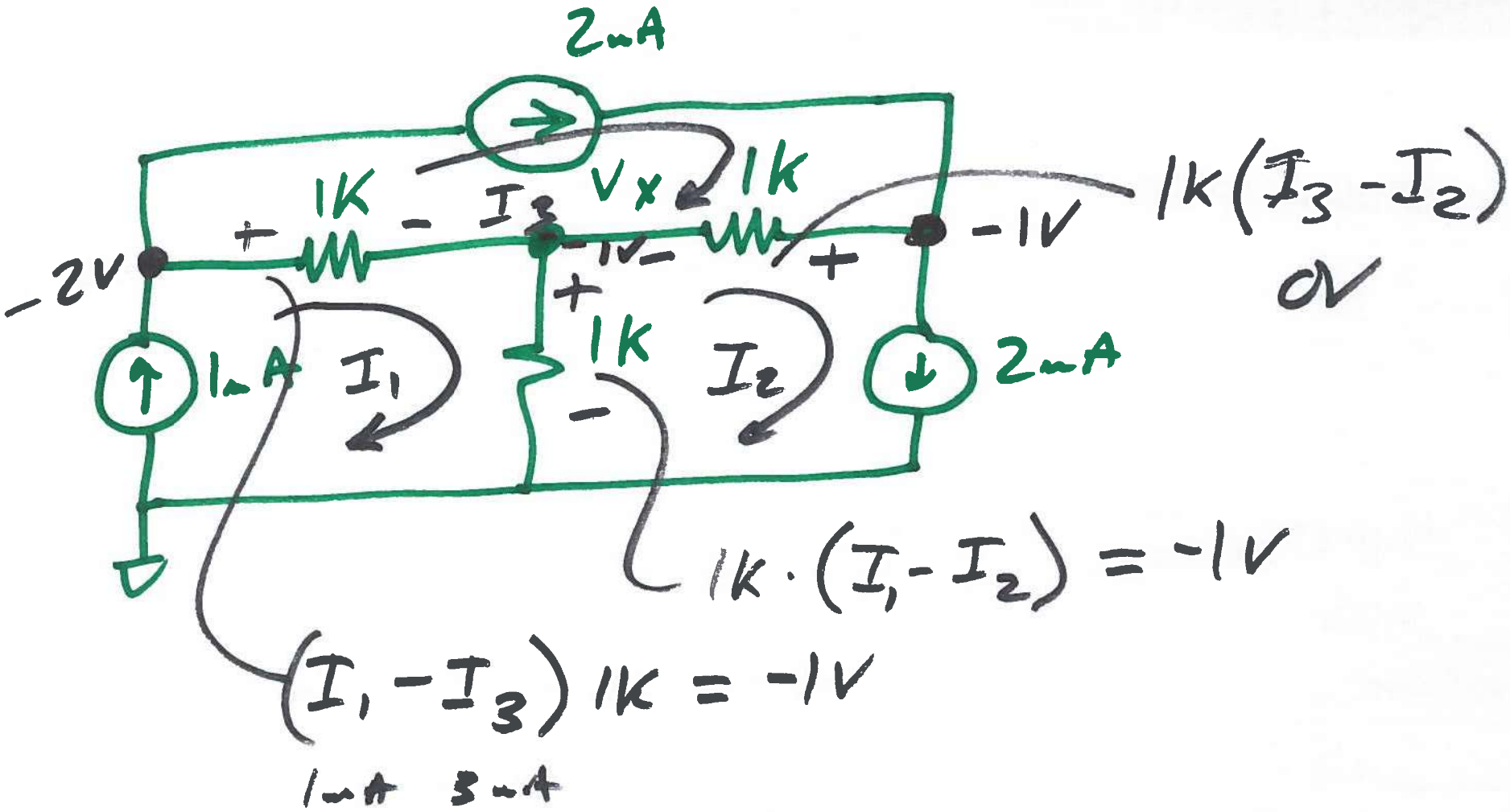
$V_2 = 1K(I_2 - I_1)$

$-2 - 1KI_3 - 1K(I_3 - I_1) = 0$

$2 + 1KI_3 + 1K(I_3 - I_1) = 0$

$I_3: -2 - 1KI_3 - 1K(I_3 - I_1) = 0$

$I_2: -2 + 1KI_2 + 1K(I_2 - I_1) = 0$


2mA
1K
Vx
1k
-2V
-1V
1mA
I1
I2
I3
1k
2mA
1k(I3 - I2)
0V
1k·(I1 - I2) = -1V
(I1 - I3) 1K = -1V
1mA
3mA