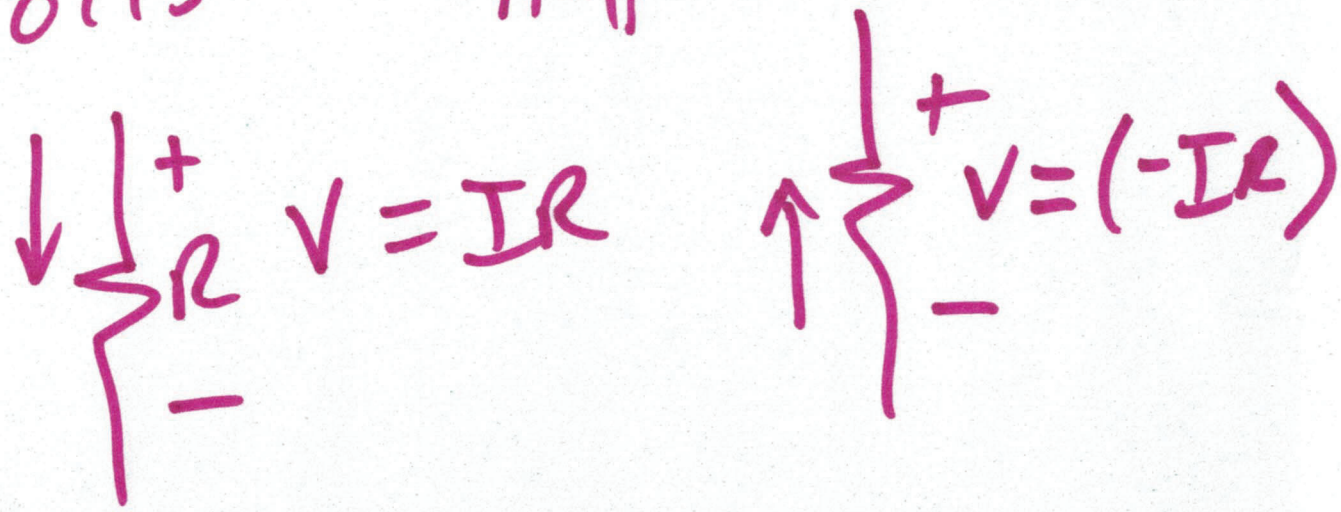
EE 221 Circuits II

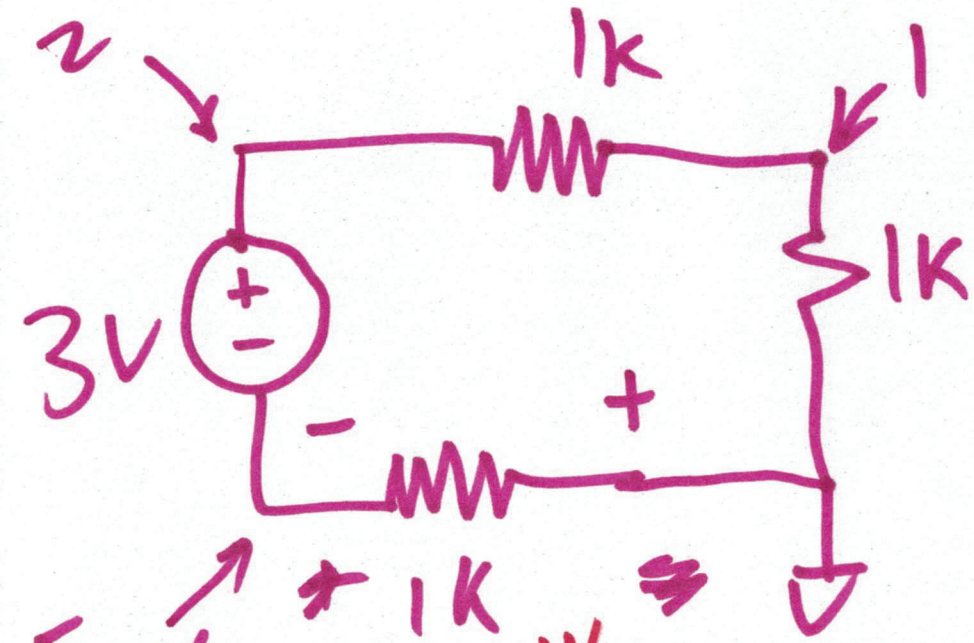
Lecture 1

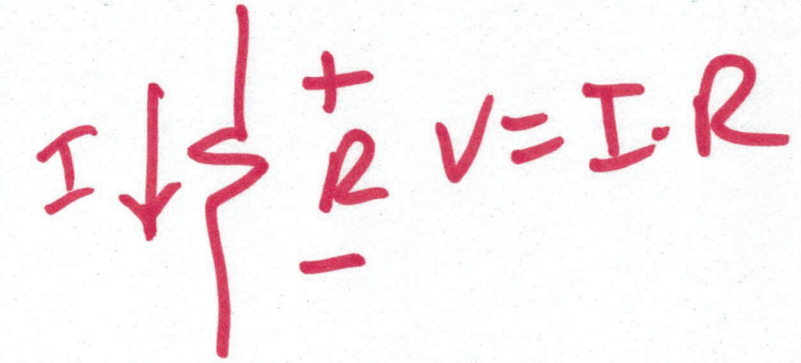
Jan. 20, 2021

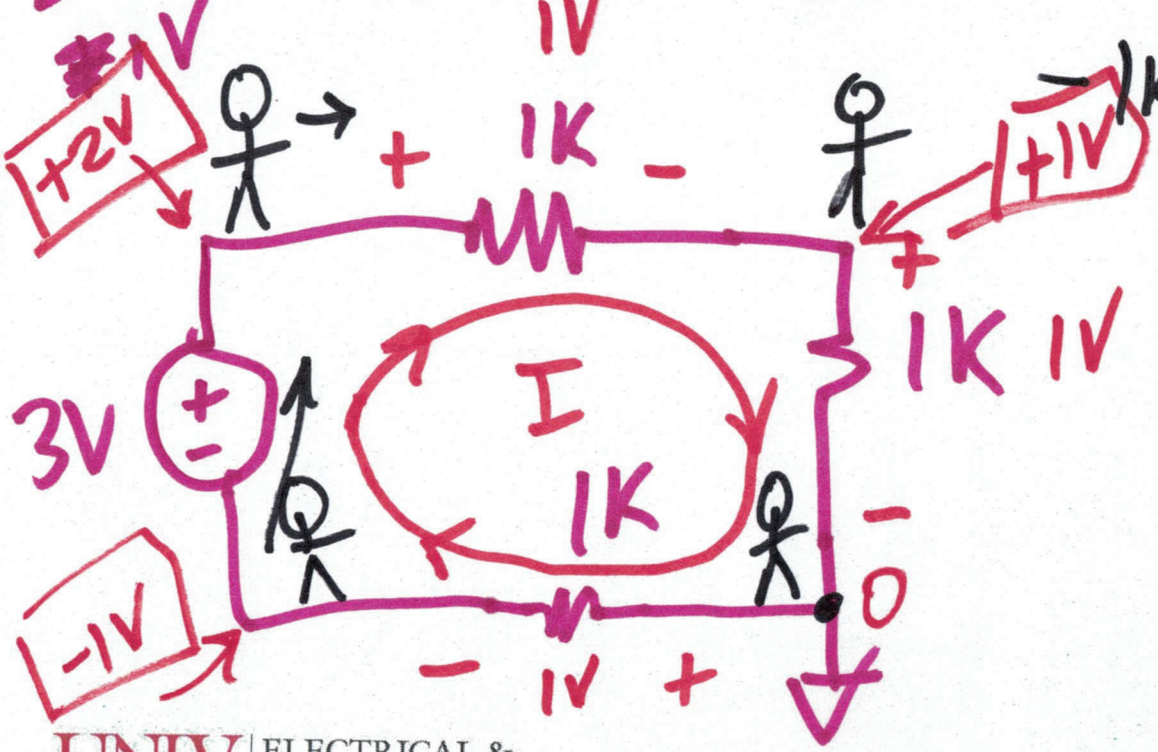
Voltage = current · Resistance

Volts Ampere Ω









$$-1K \cdot I - 1K \cdot I - 1K I + 3 = 0$$

$$I = \frac{3}{3K} = 1mA$$

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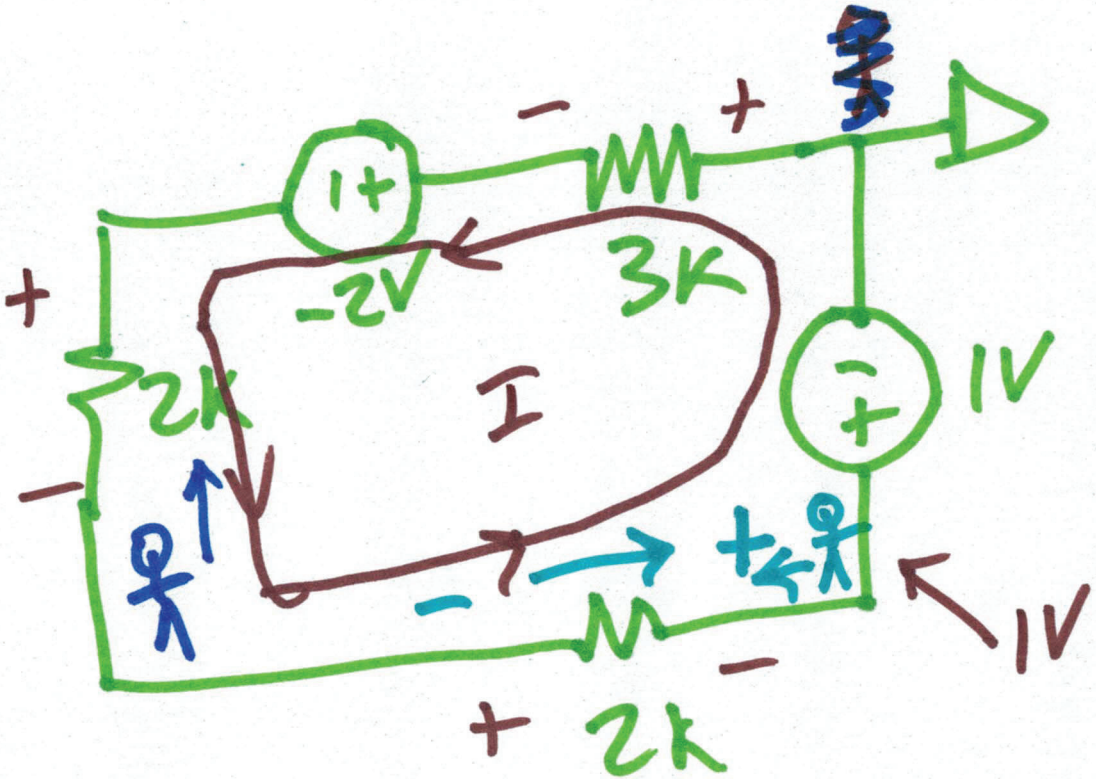
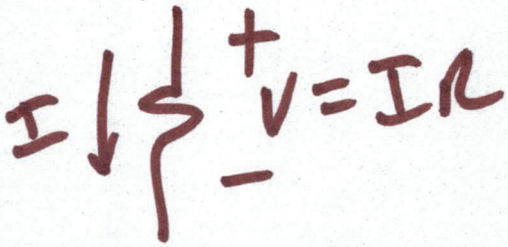
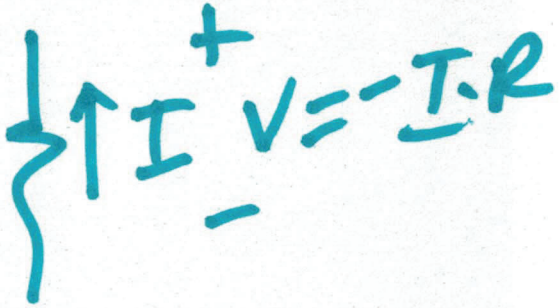
2)





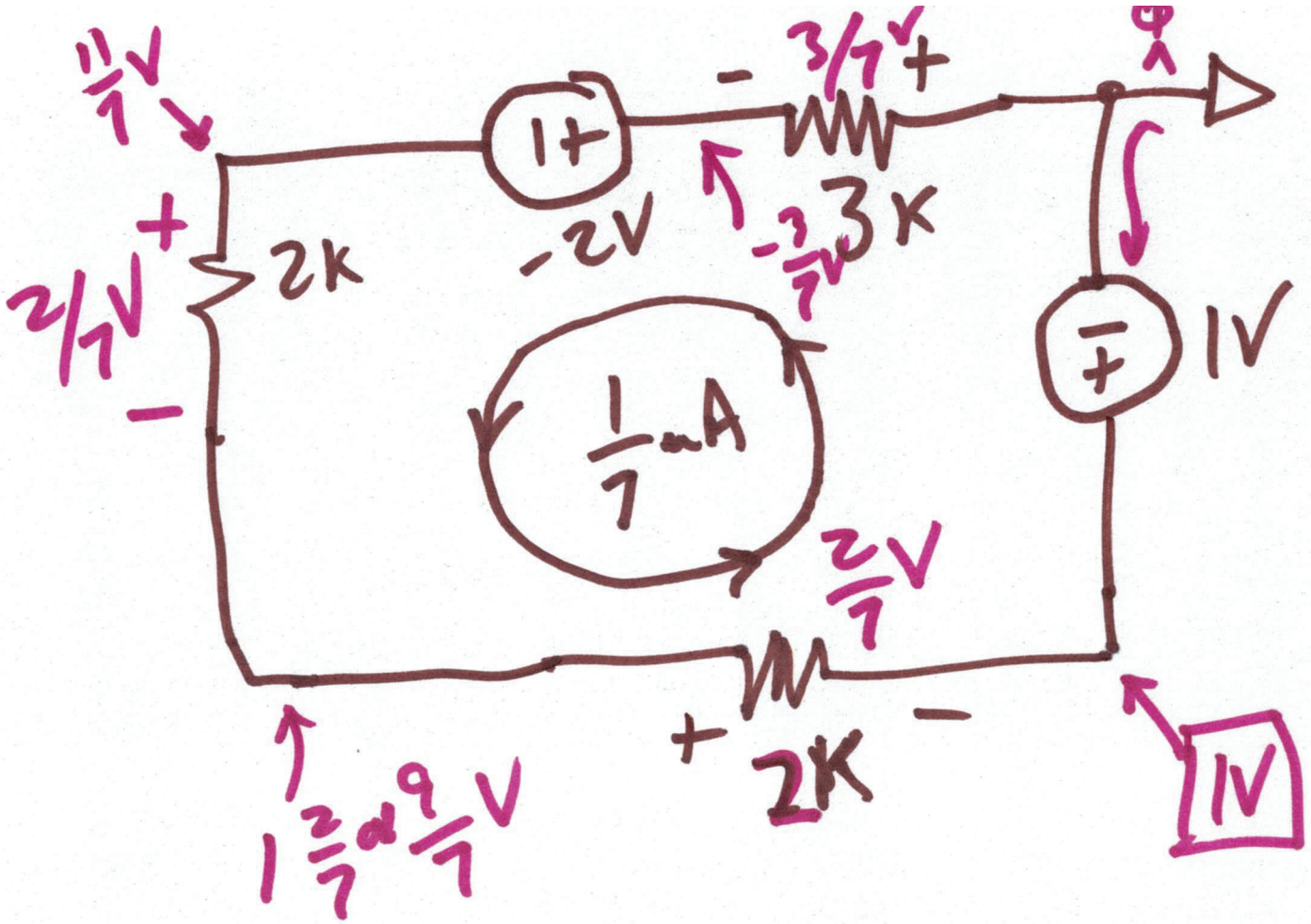


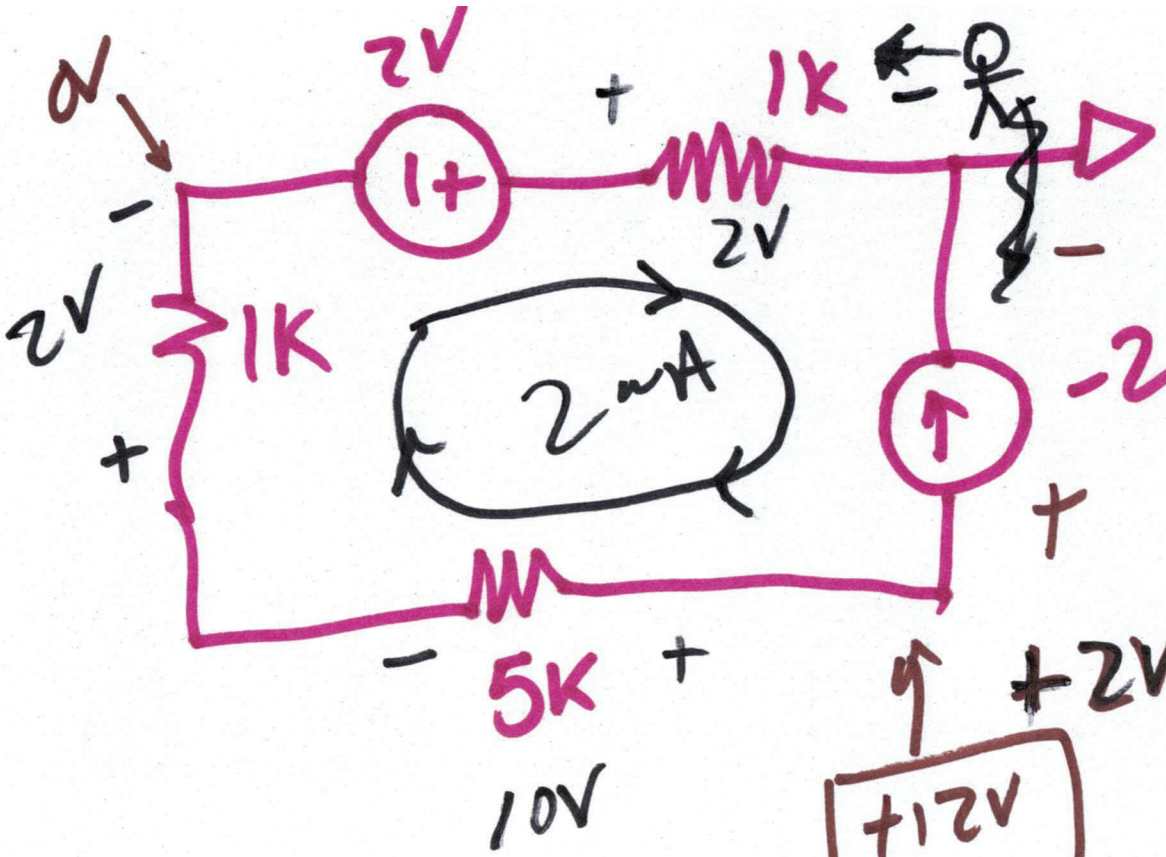
$$I \cdot 2K + (-2V) + 3KI + 1V + 2KI = 0$$

$$-(-2KI) = 0$$

$$I(7K) + (-1) = 0$$

$$\boxed{I = \frac{1}{7}\ mA}$$


11/7 V
1+
-2V
- 3/7 V +
3K
-3/7 V
2K
2/7 V
+
-
1/7 mA
1V
2/7 V
1 2/7 and 9/7 V
+
2K
-
1V

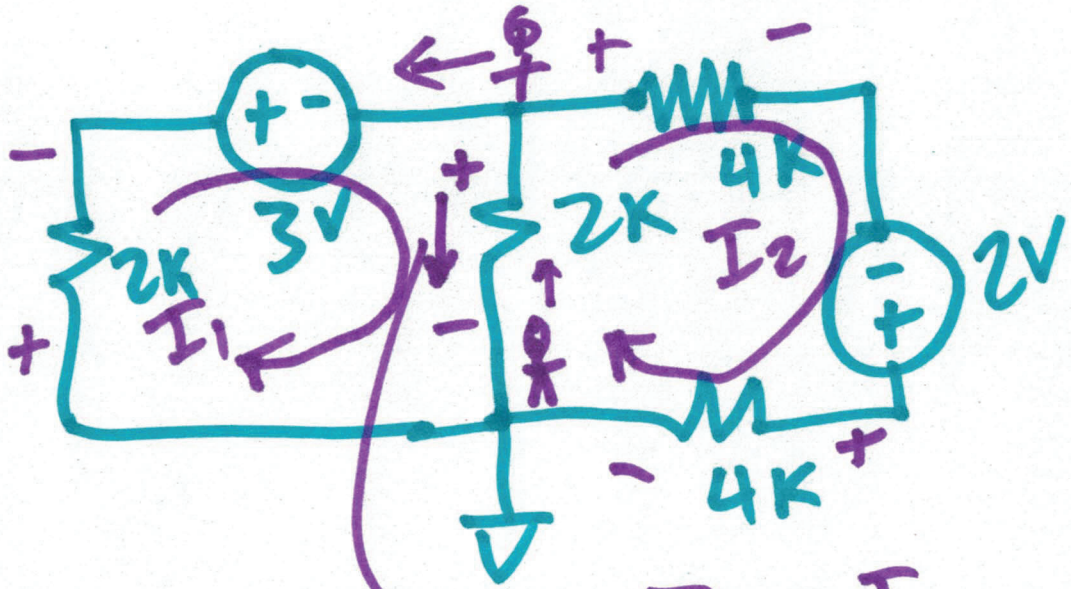


$+2V - 2V + 2 + 10$

$-V_{CS} = 0$

$V_{CS} = 12V$

5)



$$I = I_1 - I_2$$

$$+2K(I_1 - I_2) - 4K\,I_2 + 2 - 4K I_2 =$$

$$+2K(I_1 - I_2) + 3V + 2K I_1 = 0$$

$$4K \cdot I_1 + 3V - 2K I_2 = 0$$

$$4K \cdot I_1 = 2K I_2 - 3$$

$$I_1 = \frac{I_2}{2} - \frac{3}{4}$$

$$2k I_1 - 10k I_2 + 2 = 0$$

$$I_1 = \frac{I_2}{2} - \frac{3}{4}\,mA$$

$$1k I_2 - 1.5V - 10k I_2 + 2V = 0$$

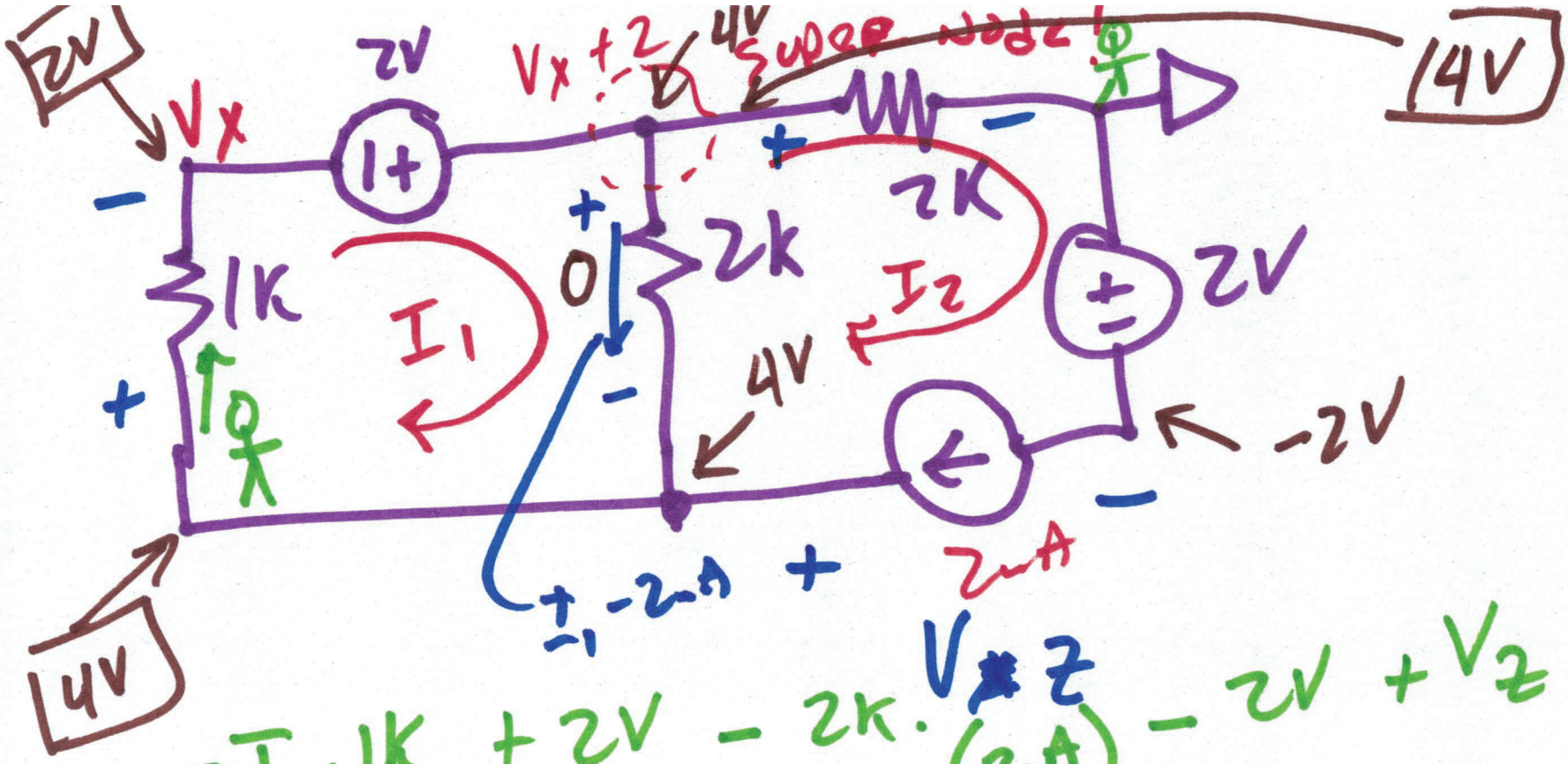
$$-9k I_2 = -\frac{1}{2}V$$

$$\boxed{I_2 = \frac{1}{18}\,mA}$$

$$I_1 = \frac{1}{36}\,mA - \frac{3}{4}\,mA$$

$$I_1 = \frac{-26}{36}\,mA = \frac{1}{36}\,mA - \frac{27}{36}\,mA$$

$$\boxed{I_1 = \frac{-13}{18}\,mA}$$



$$-I_1 \cdot 1K + 2V - 2K \cdot V_{2K} - 2V + V_2 = 0$$

$$(2mA)$$

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

$$-3kI_1 + 6V = 0 \rightarrow I_1 = \frac{-6}{-3K}$$

$$I_1 = 2mA$$

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