

# EE 220 Circuits 1

Lecture 10

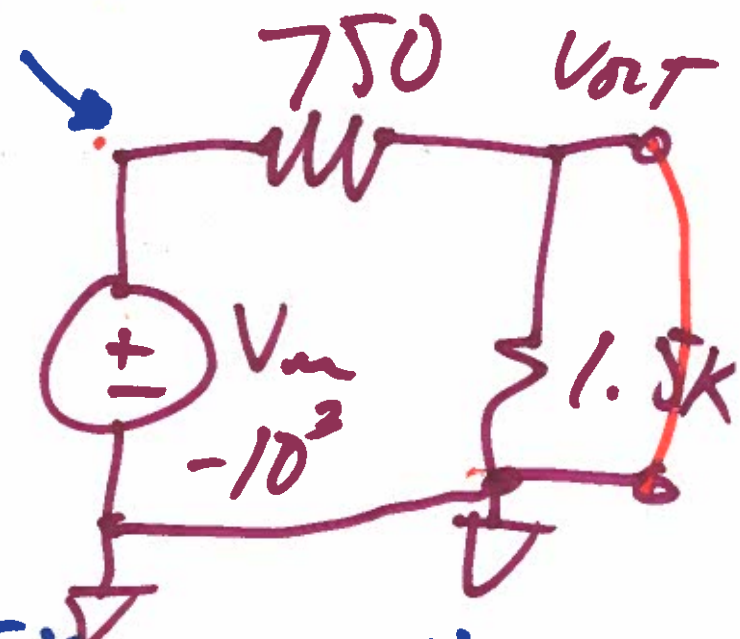
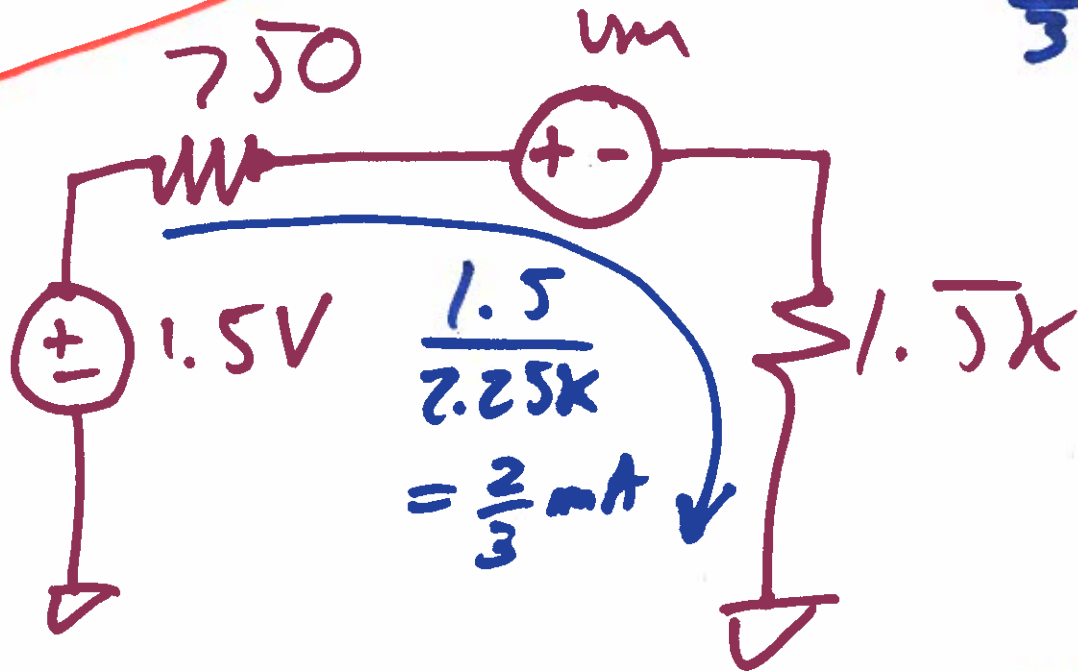
2019

Sept. 30,

$$I_{sc} = \frac{-2/3}{750}$$

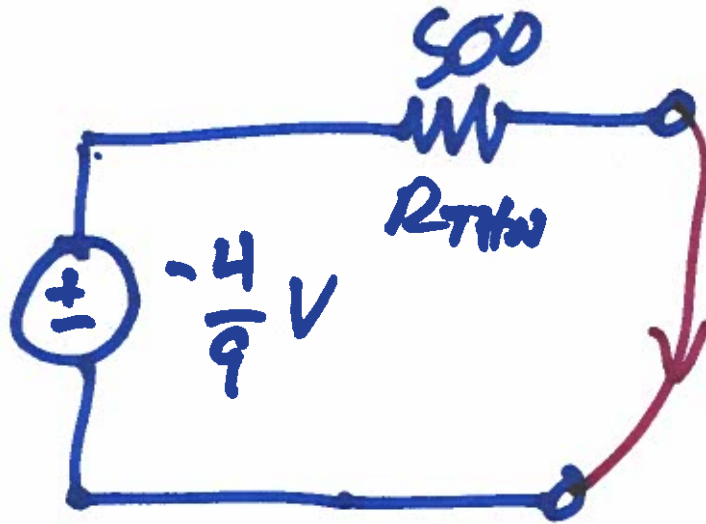
$$= -\frac{8}{9} \text{ mA}$$

$$\frac{2}{3} \text{ mA} \cdot (-10^3) = -\frac{2}{3} \text{ V}$$



$$V_{RT} = -\frac{2}{3} \cdot \frac{1.5 \text{ k}}{2.25 \text{ k}} = -\frac{4}{9} \text{ V}$$

1)



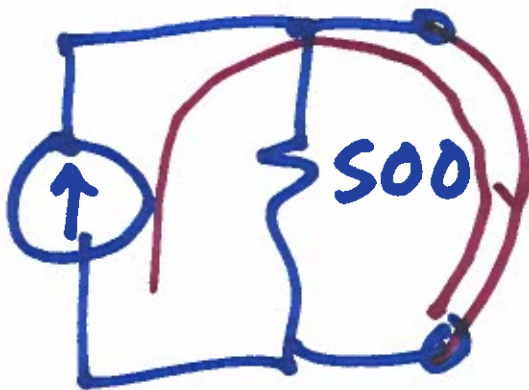
$$I_{SC} = \frac{-\frac{4}{9}}{500} = \underline{\underline{-\frac{8}{9} \mu A}}$$

$$R_{TH} = 750 \parallel 1.5k$$

$$= \frac{750 \cdot 1.5k}{750 + 1.5k}$$

$$= \frac{\cancel{7.250} \cdot 1.5k}{\cancel{9.250}}$$

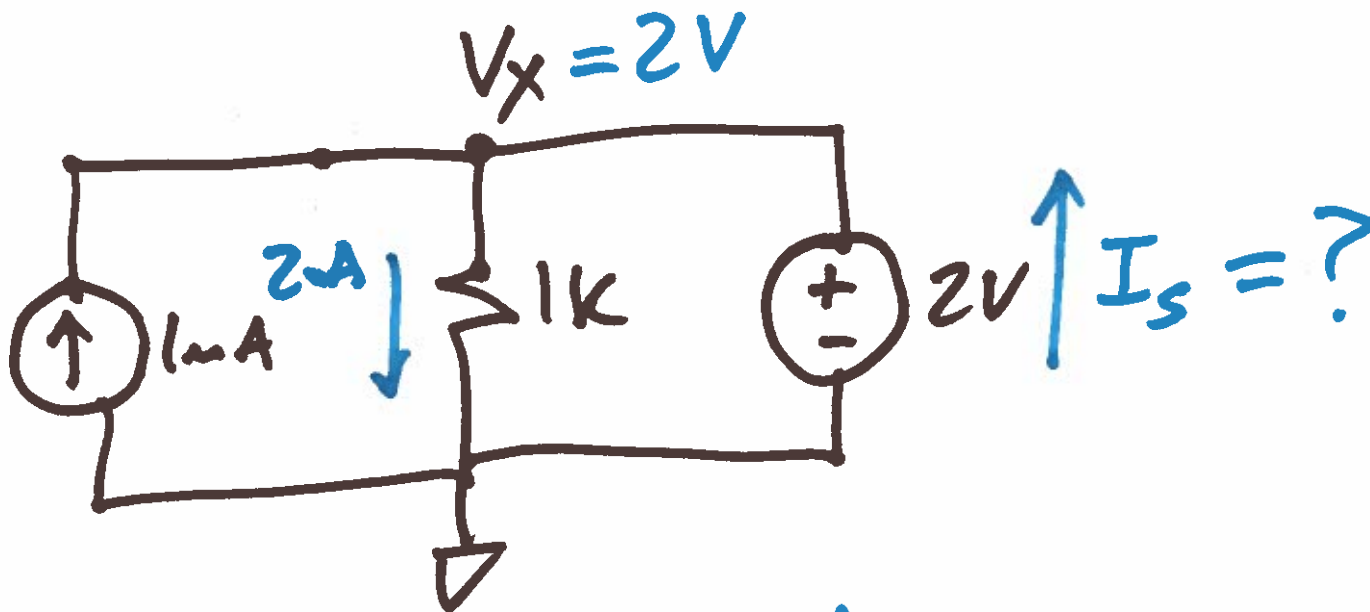
$$\frac{-\frac{4}{9}}{500}$$



$$I_{SC} = \frac{-4}{4500} \quad R_{TH} = 500 \Omega$$

$$= -\frac{8}{9} \mu A$$

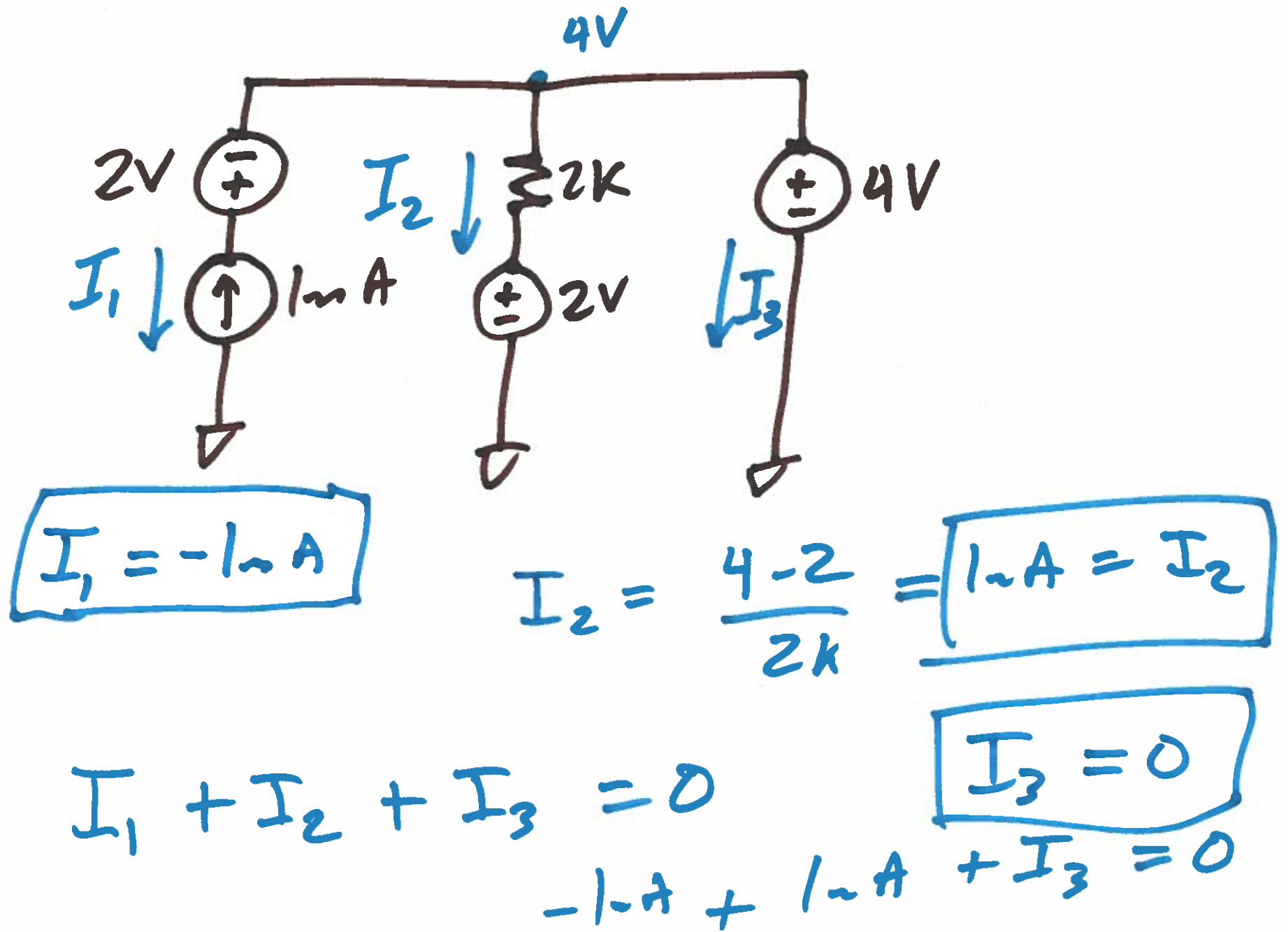
2)



$$1mA + I_s = 2mA$$

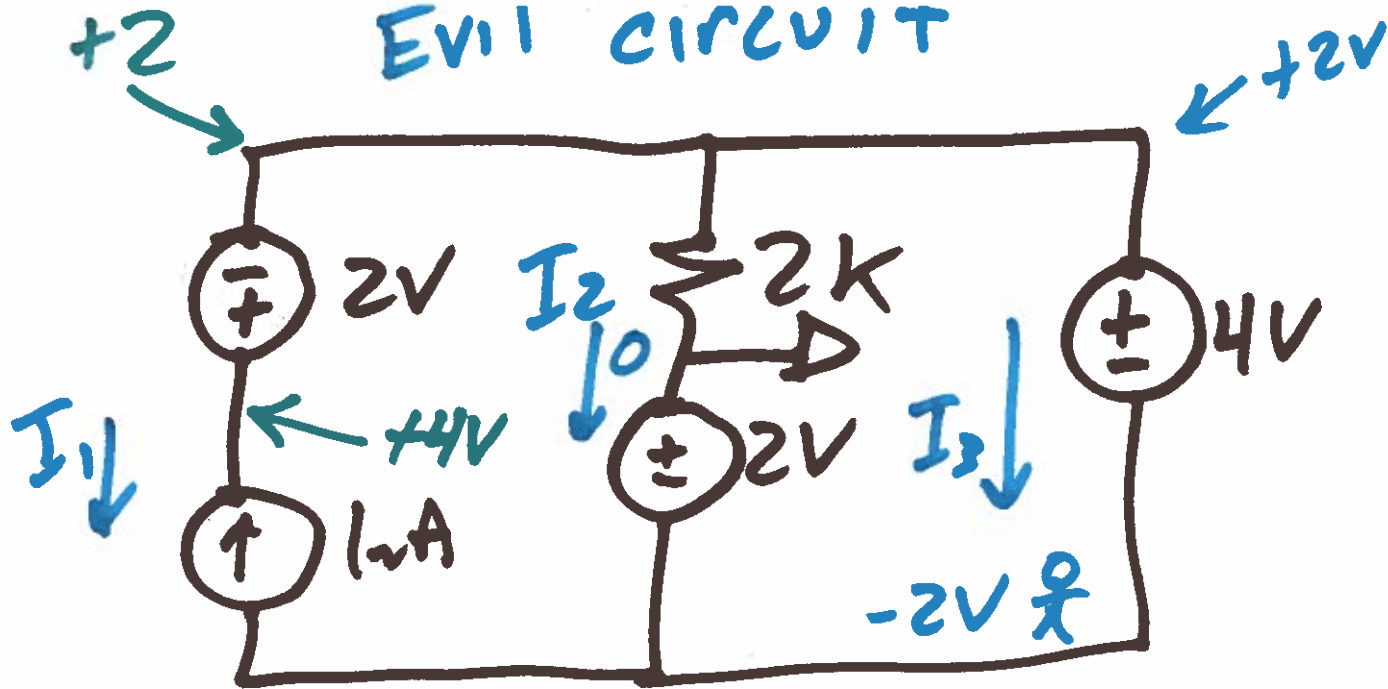
$$I_s = 1mA$$

3)



4)

# EVIL CIRCUIT



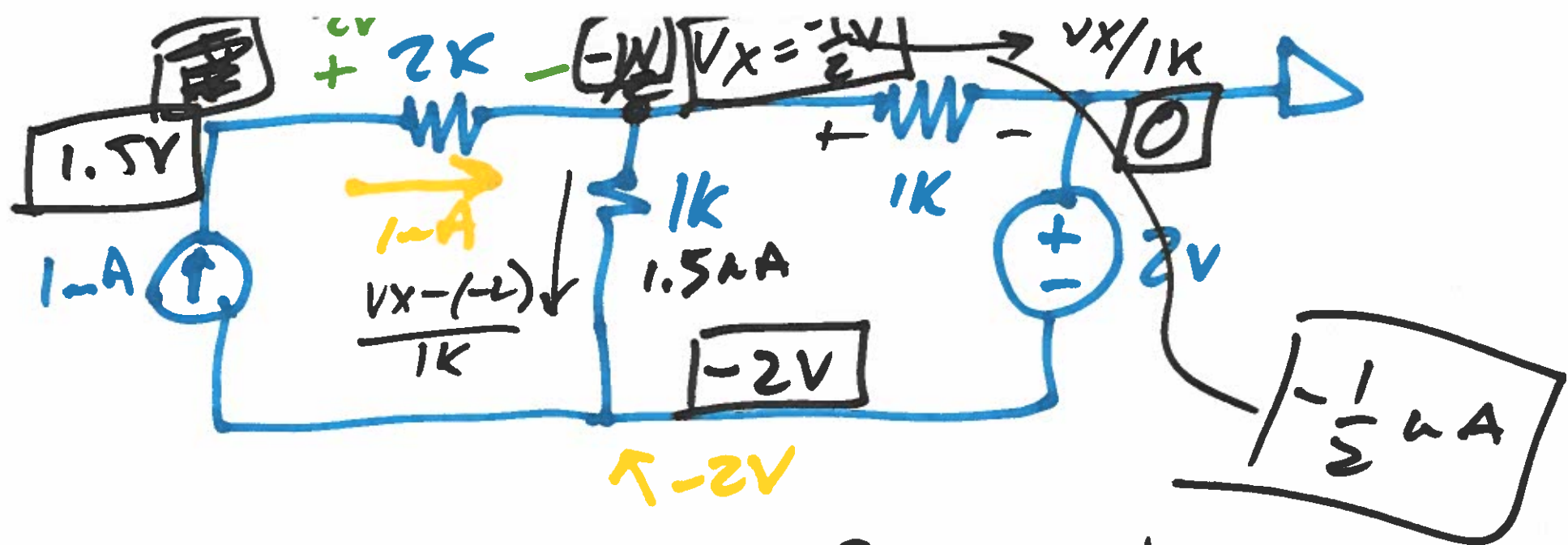
$$I_1 = -1\text{mA}$$

$$I_2 = \frac{2\text{V} - 0}{2\text{k}} = 1\text{mA} = I_2$$

$$I_1 + I_2 + I_3 = 0$$

$$I_3 = 0$$

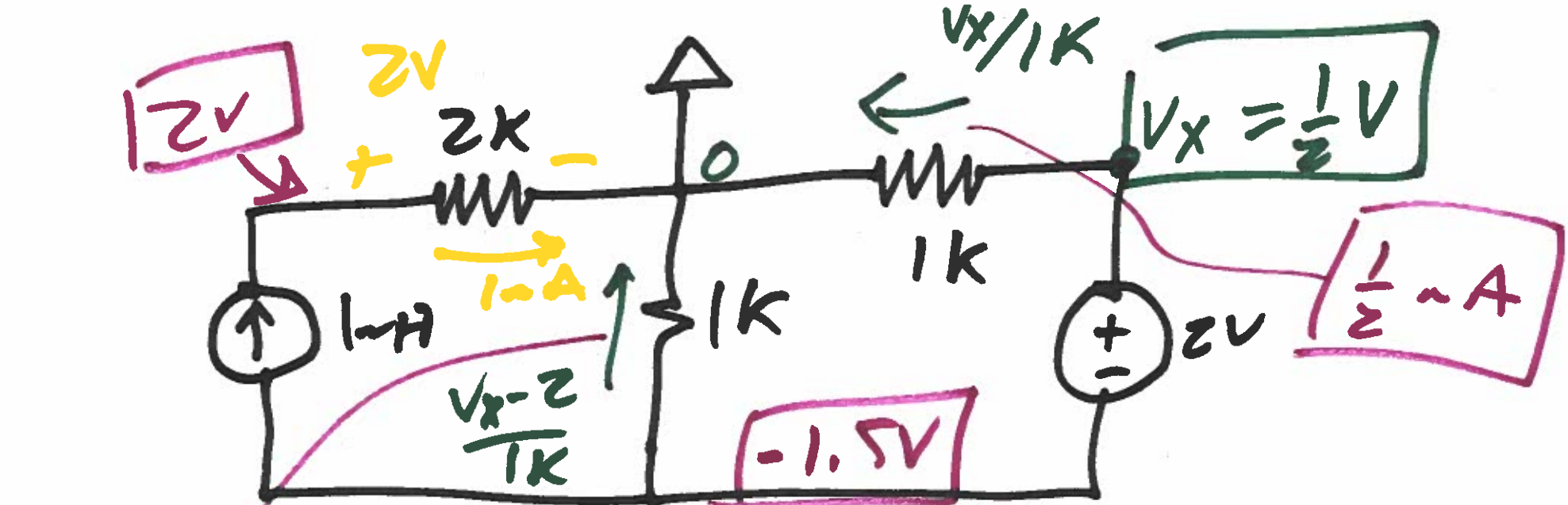
5)



$$1mA = \frac{V_x + 2}{1k} + \frac{V_x}{1k}$$

$$1V = V_x \cdot 2 + 2$$

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



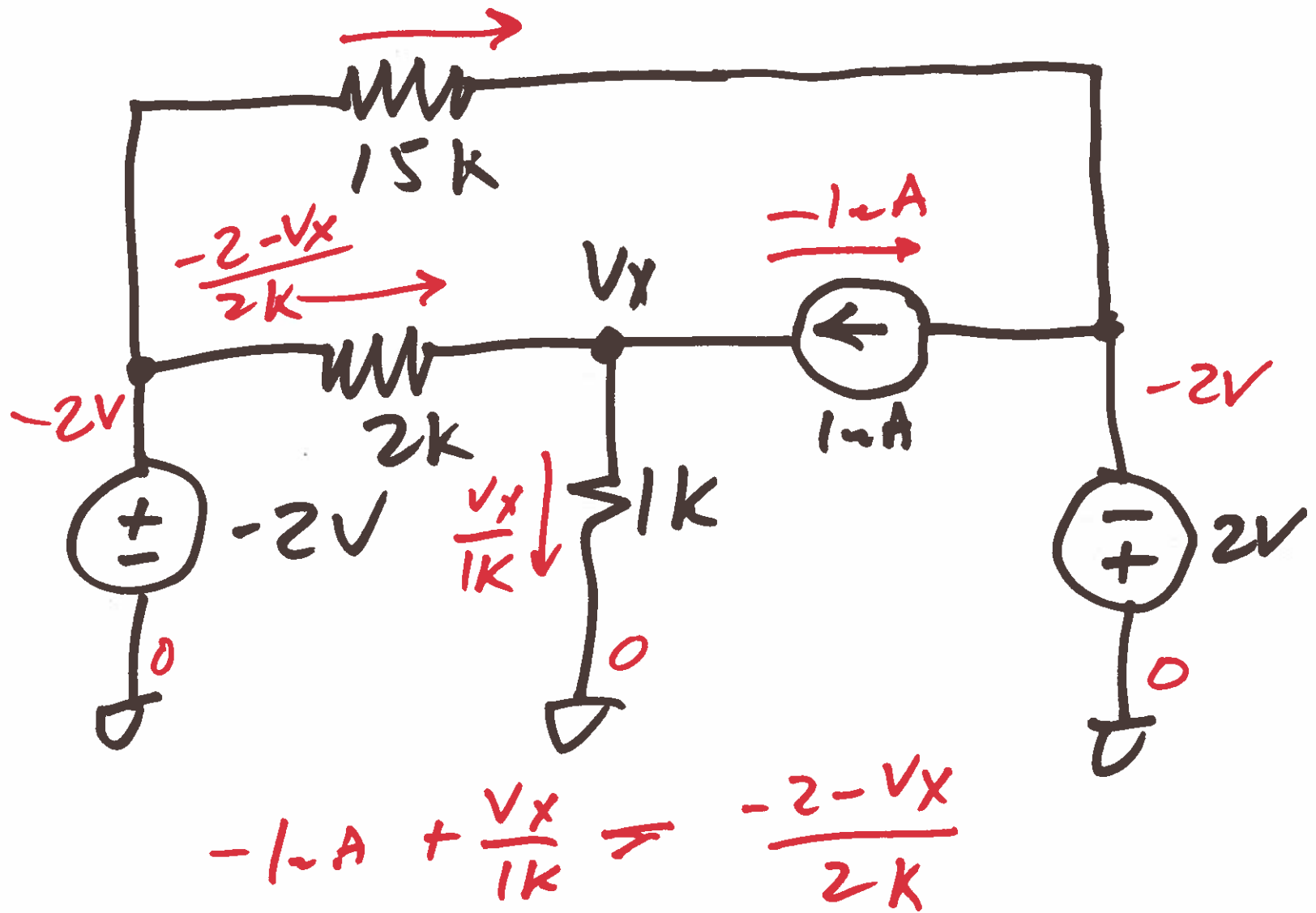
$$1mA + \frac{V_x - 2}{1k} + \frac{V_x}{1k} = 0$$

$$1V + V_x - 2 + V_x = 0$$

$$2V_x = +1$$

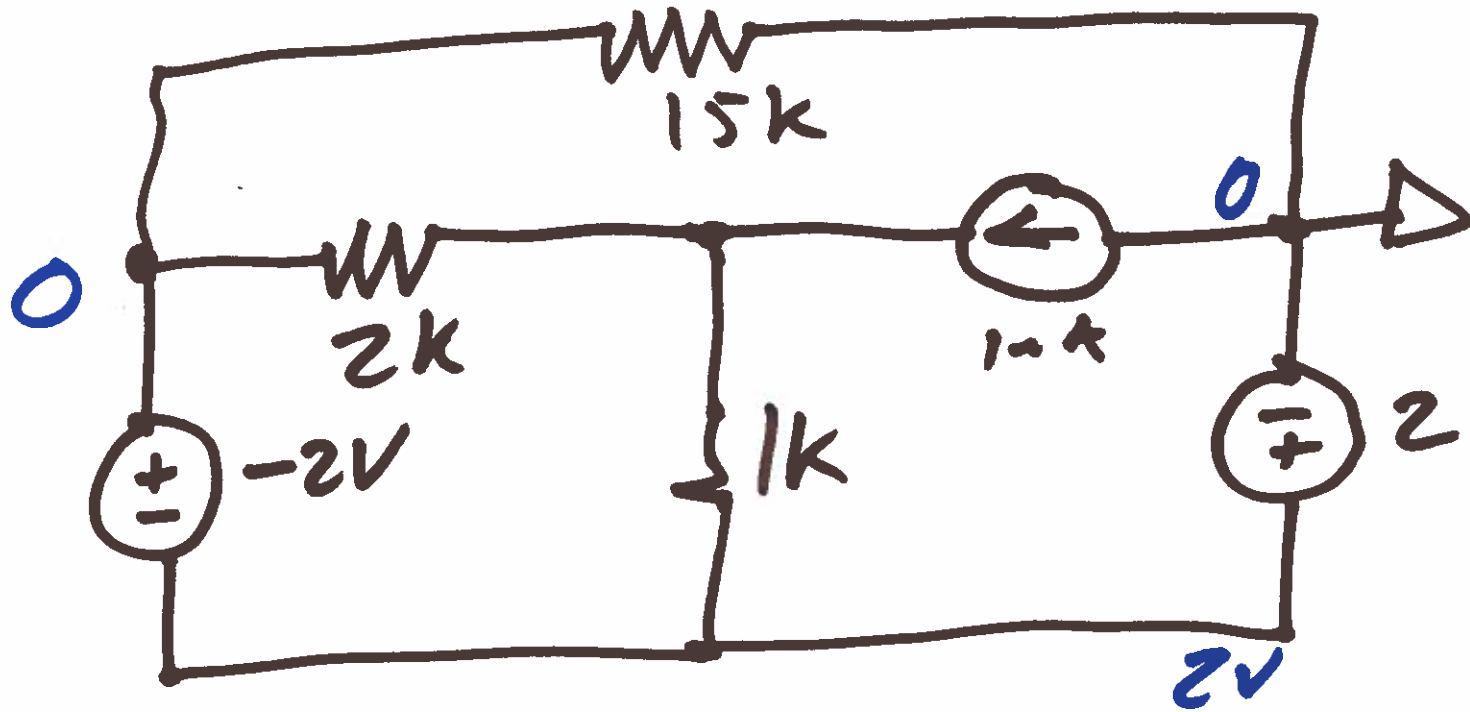
$$V_x = \frac{1}{2}V$$

1)



8)





9)