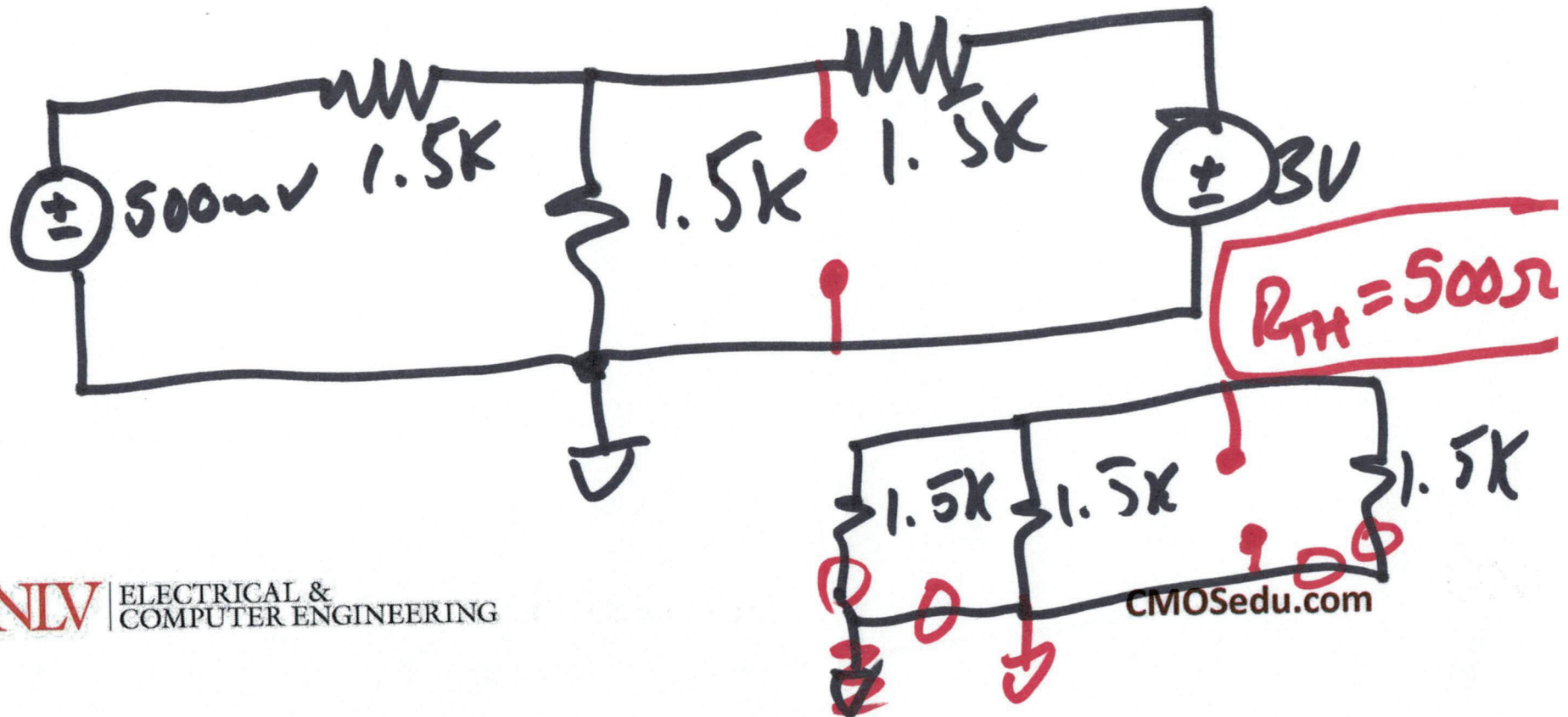


EE 220 circuits 1

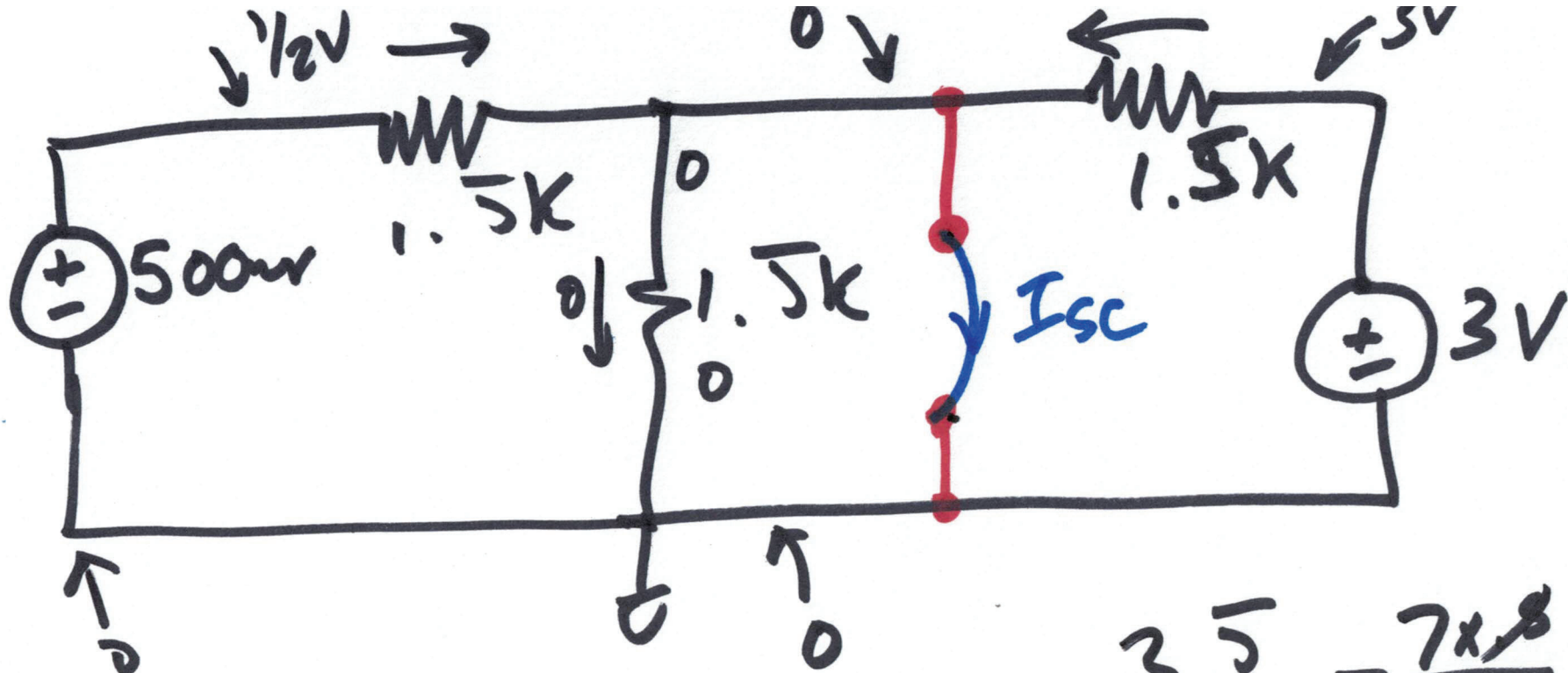
Lecture 8

Sept. 20, 2021

$$\frac{1}{R_T} = \frac{1}{1.5K} + \frac{1}{1.5K} + \frac{1}{1.5K}$$



11



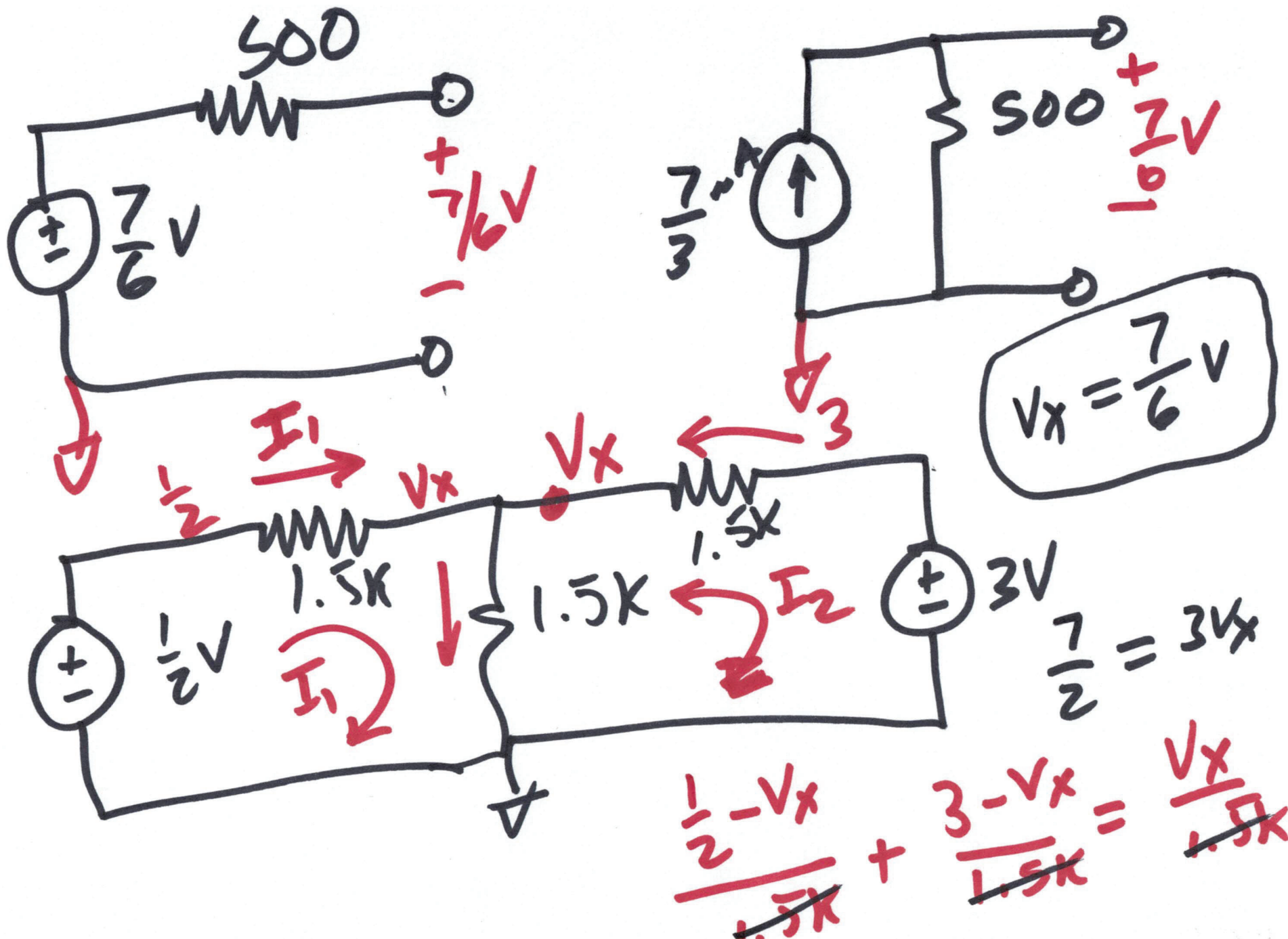
$$I_N = I_{sc} = \frac{\frac{1}{2} - 0}{1.5K} + \frac{3 - 0}{1.5K} = \frac{3.5}{1.5K} = \frac{7 \times 10^{-3}}{3 \times 10^{-3}} = 7 \text{ mA}$$

$$V_{TH} = I_{sc} \cdot R_{TH} = 7 \text{ mA} \cdot \frac{1}{2} K\Omega = \frac{7}{2} \text{ mV} = 3.5 \text{ mV}$$

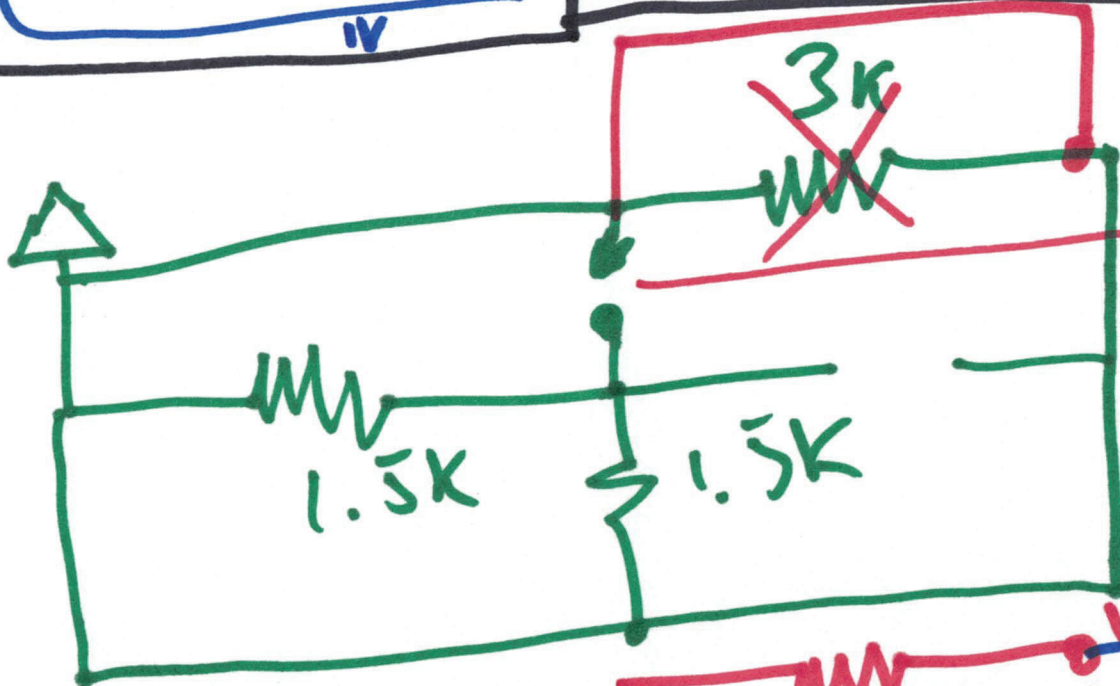
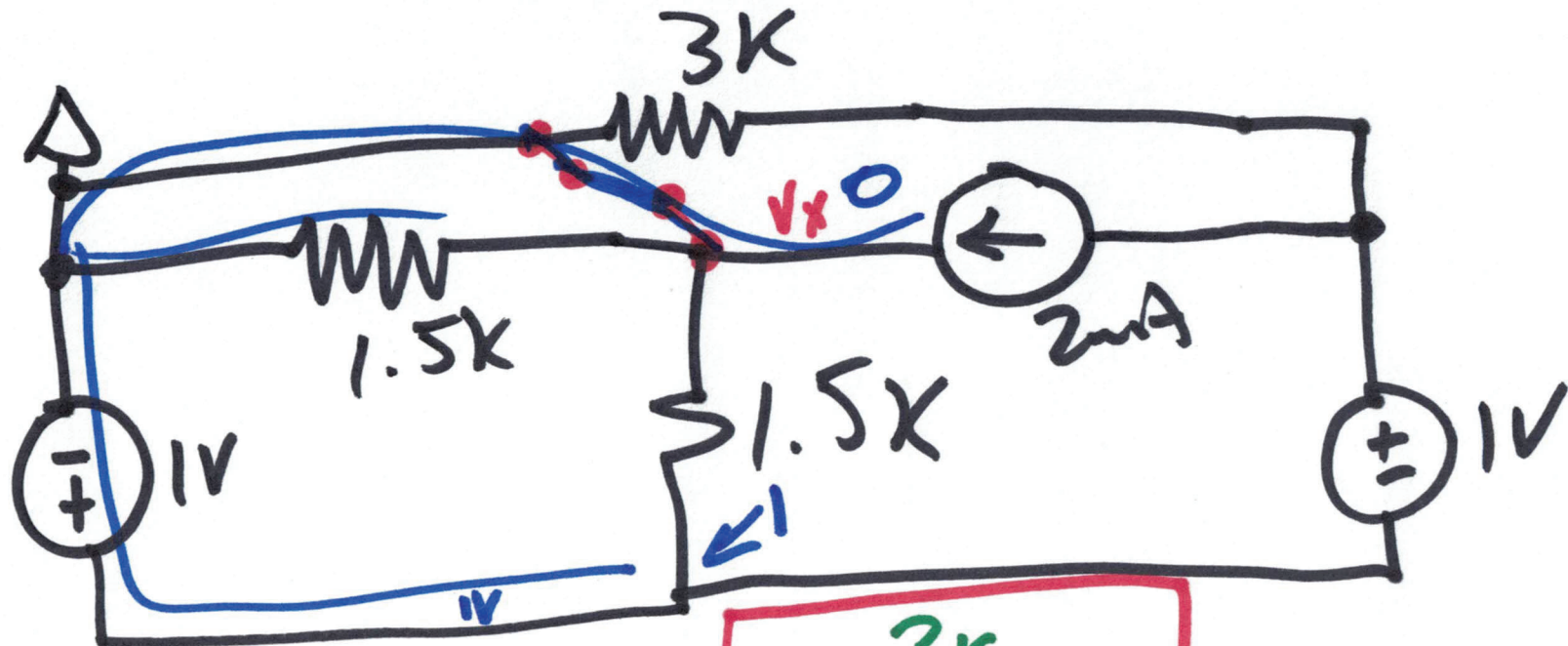
$$V_{TH} = \frac{7}{6} \text{ V}$$

$$I_N = 2.333 \text{ mA}$$

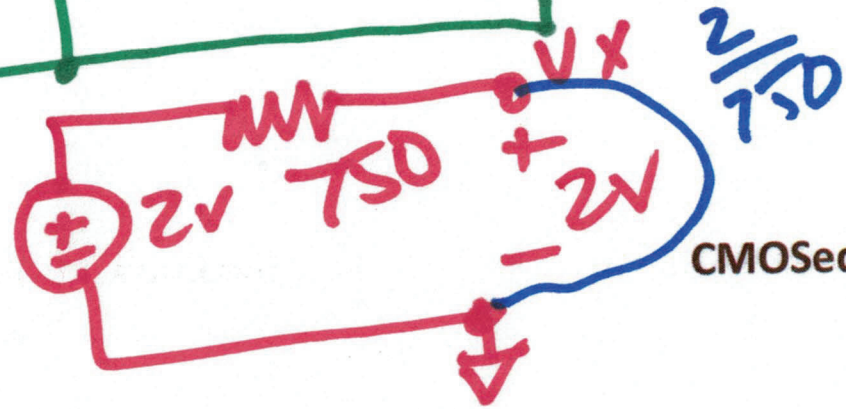
2)



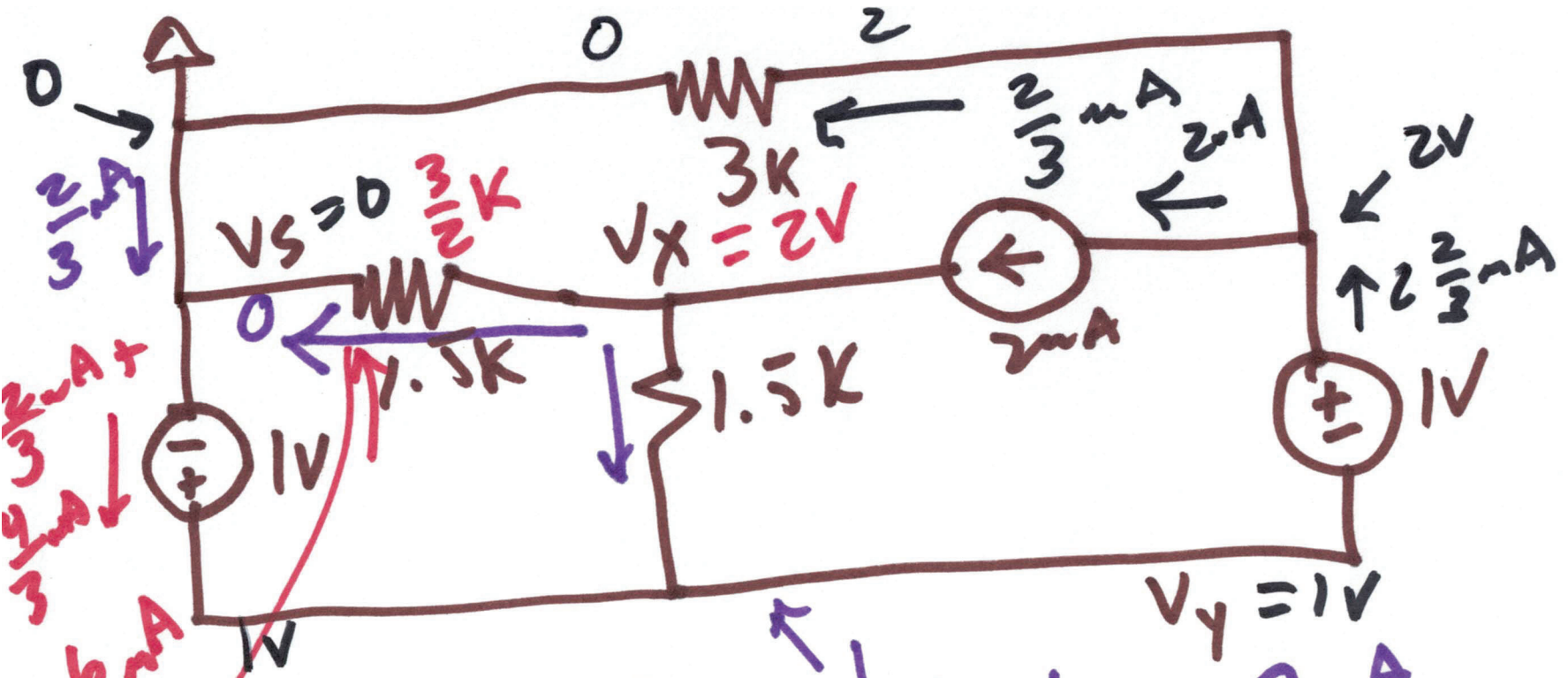
3)



$R_{TH} = 750\Omega$   
 $= 1.5K \parallel 1.5K$



5)



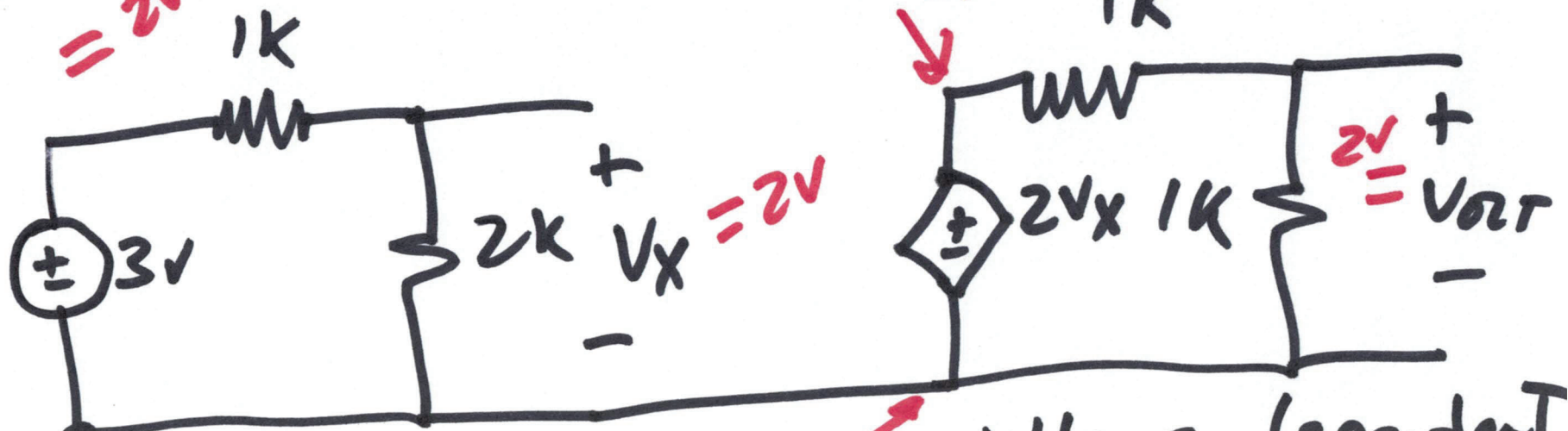
$2 \mu A + 3 \mu A + 3 \mu A + 3 \mu A = 6 \mu A = 2 \mu A$

$$\begin{aligned}
 \frac{V_x - 0}{1.5k} + \frac{V_x - 1}{1.5k} &= 2 \mu A \quad (V_y = 1V) \\
 \frac{2 - 0}{\frac{3}{2}k} &= \frac{4}{3} \mu A \\
 \frac{3}{2}k &= 1.5k \\
 V_x + V_x - 1 &= 3V \\
 2V_x &= 4 \\
 \boxed{V_x = 2V}
 \end{aligned}$$

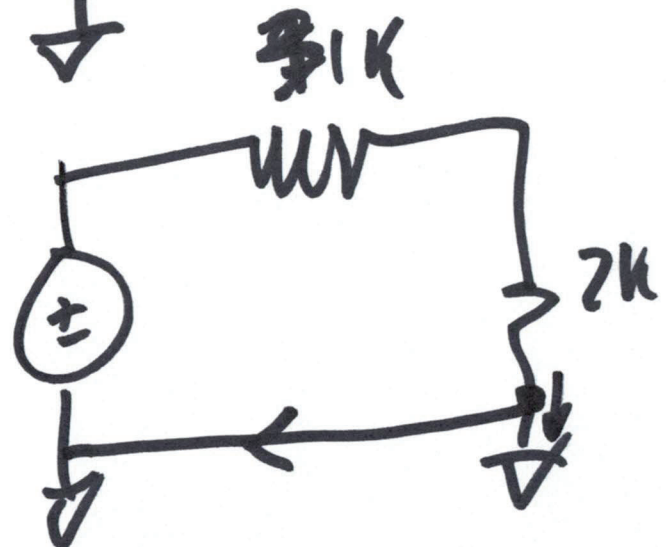
4)

# Dependent source

$V_x = 3 \cdot \frac{2}{2+1} = 2V$



0 voltage dependent voltage source



5)