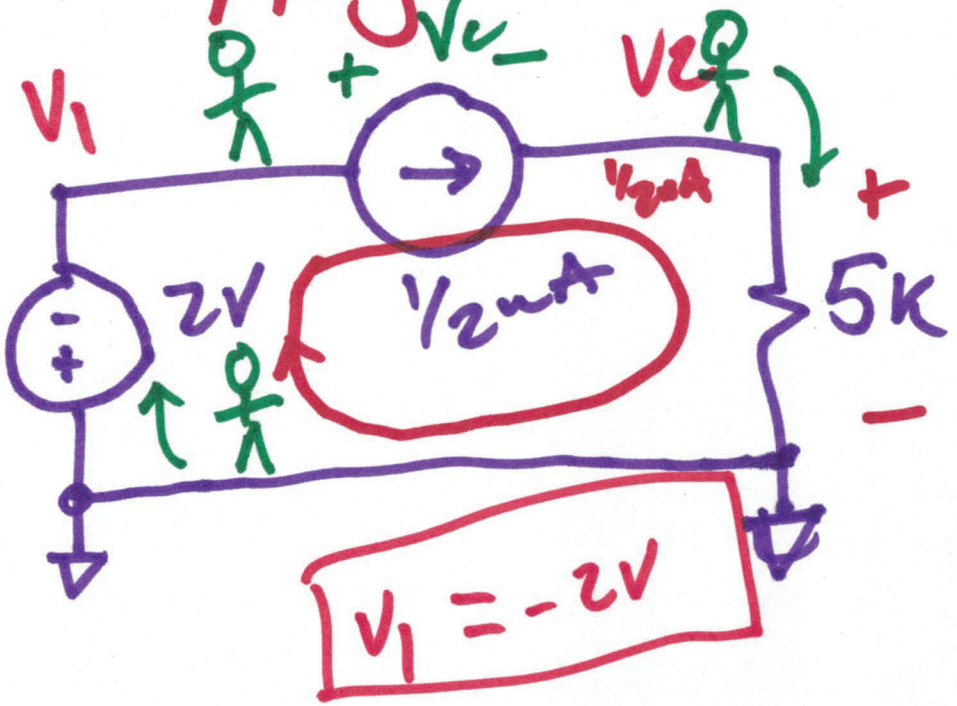
EE 220 Circuits I

Lecture 3

August 30, 2021

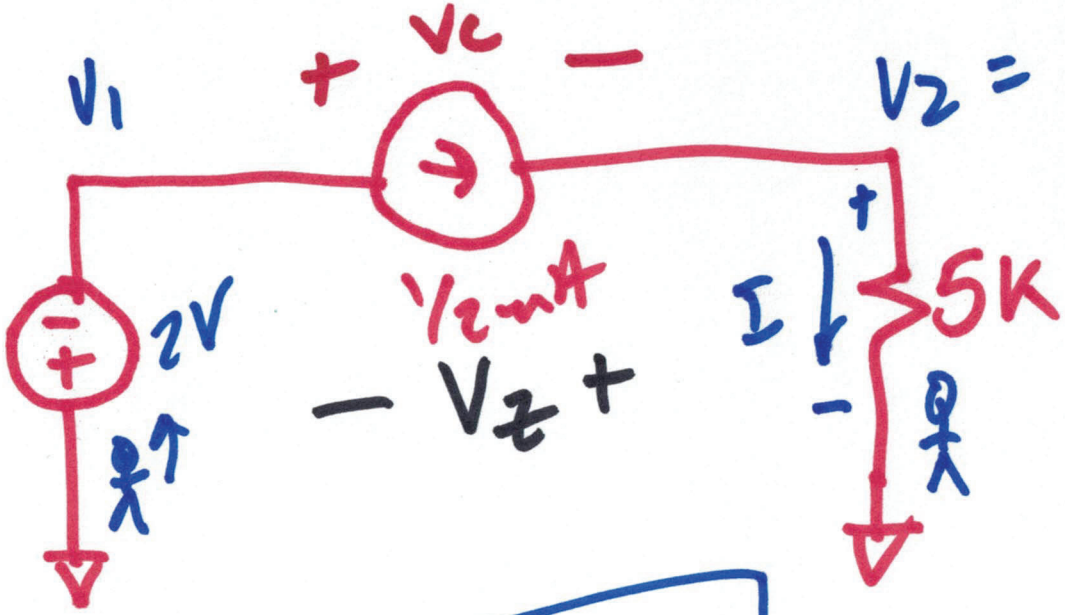


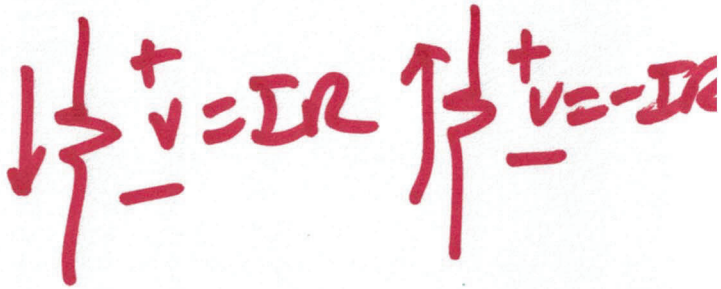
$10^3 \quad 10^{-3}$

$-5K \cdot \frac{1}{2}mA - 2 - V_c = 0$

$-2.5 - 2 - V_c = 0$

$\boxed{V_c = -4.5V}$





$V_1 = -2V$

½ mA

$V_2 = I \cdot 5K$

$V_2 = 2.5V$

$V_c = -V_1 - V_2$

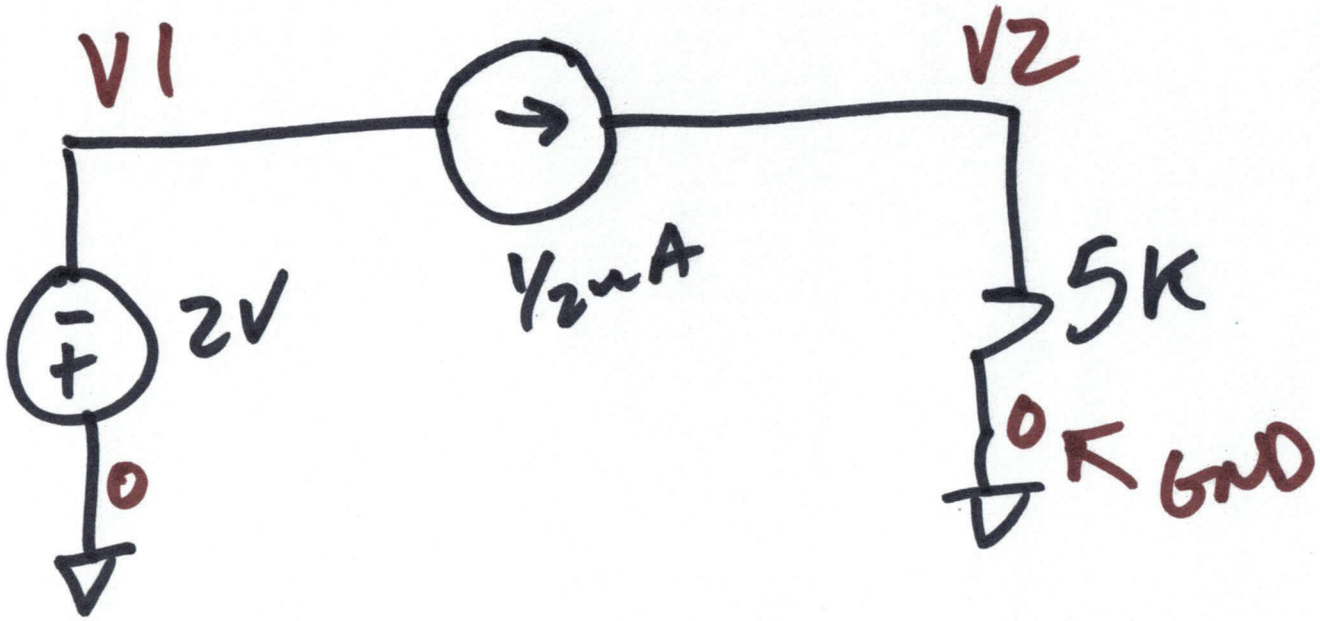
$= -2 - 2.5$

$V_c = -4.5V$

$V_2 = V_2 - V_1$

$= 2.5V - (-2V)$

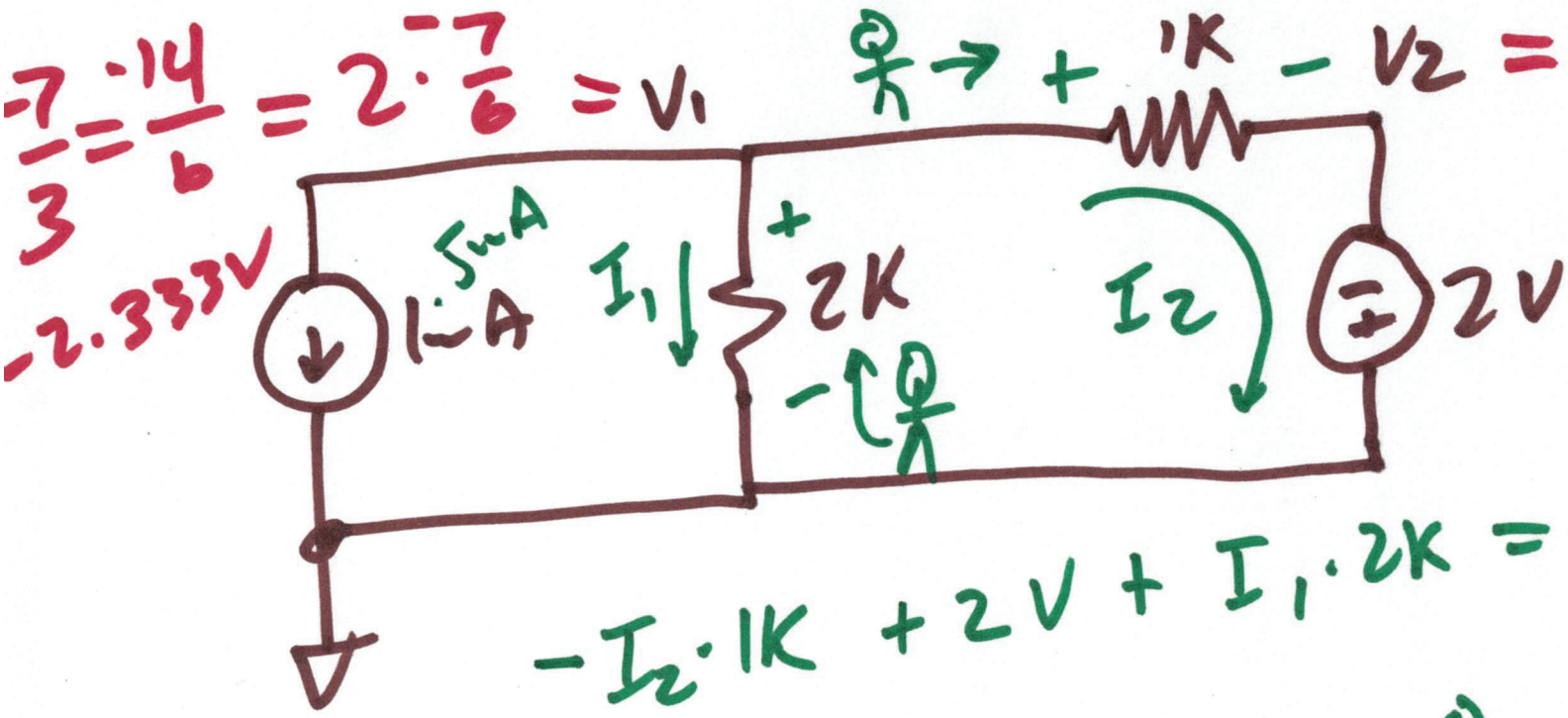
$V_2 = 4.5V$




```
Title
*
VIN   0   V1   2V
R1    V2  0    5K
IS    V1  V2   500u
.OP
.END
```

$\frac{-7}{3} = \frac{-14}{6} = 2 - \frac{7}{6} = V_1$

$-2.333V$



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

$$I_1 + I_2 + 1.5mA = 0$$

$$I_1 = -(I_2 + 1.5mA)$$

$$-I_2 \cdot 1K + 2V + \frac{2K}{3}(-I_2 - 1.5mA) = 0$$

$$-I_2 \cdot 1K + 2 - 2KI_2 - 3V = 0$$

$$-3kI_2 - 1 = 0$$

$$I_2 = -\frac{1}{3}\,mA$$

$$I_1 + -\frac{1}{3}mA + \frac{3}{2}mA = 0$$

$$I_1 + -\frac{2}{6}mA + \frac{9}{6}mA = 0$$

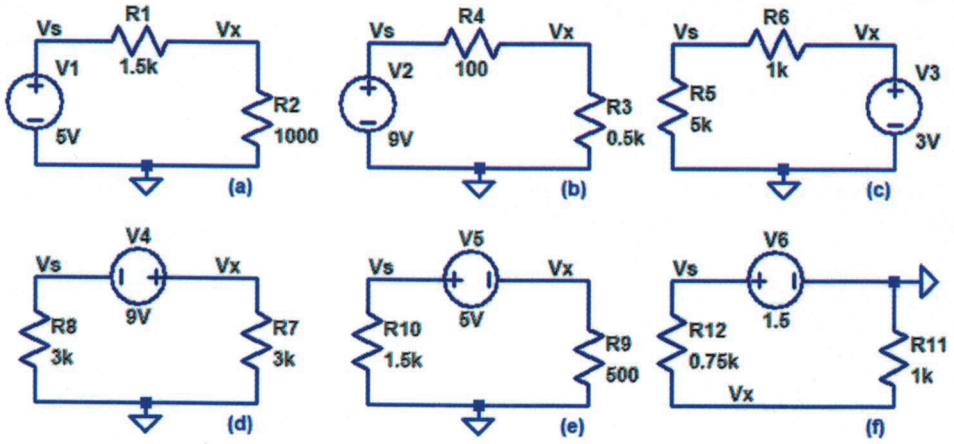
$$I_1 = -\frac{7}{6}mA$$

$$\boxed{I_1 = -1\frac{1}{6}mA}$$

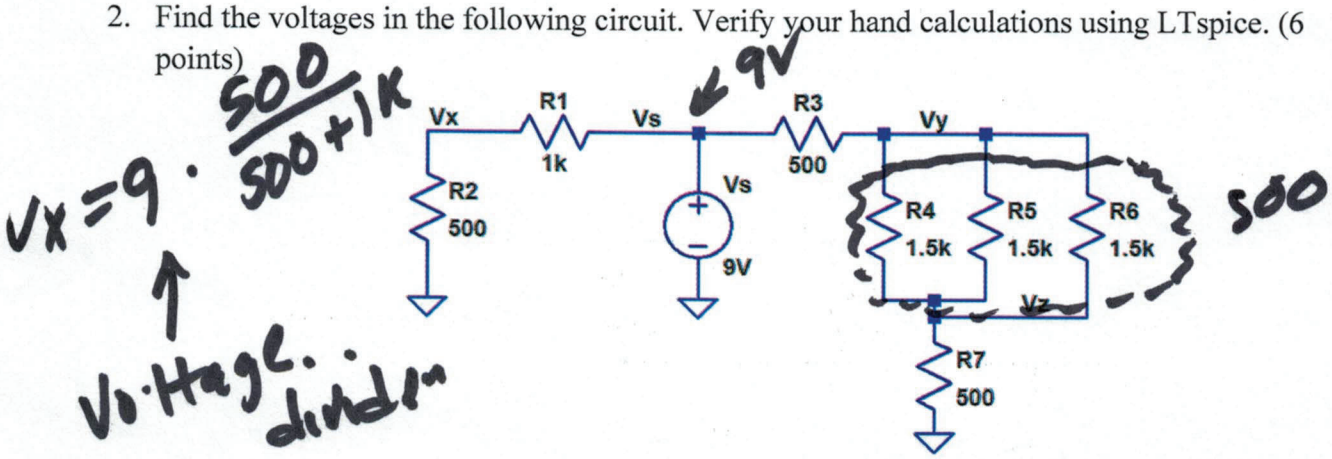
H.W. #3 EE 220 Fall 2021

Show your work for credit and put a box around each of your answers!

1. Find the voltages Vx and Vs as well as the currents (assume a clockwise direction) flowing in each of the following circuits. Verify your hand calculations using LTspice. (9 points)



2. Find the voltages in the following circuit. Verify your hand calculations using LTspice. (6 points)



3. Show how to derive the voltage divider equation and the current divider equation for a two-resistor circuit. Ensure your derivation includes the two schematics you are using. Provide an example for each derivation. (4 points)
4. Find the voltage across R1, as indicated, in the following circuit. Verify your answer using LTspice. (2 points)