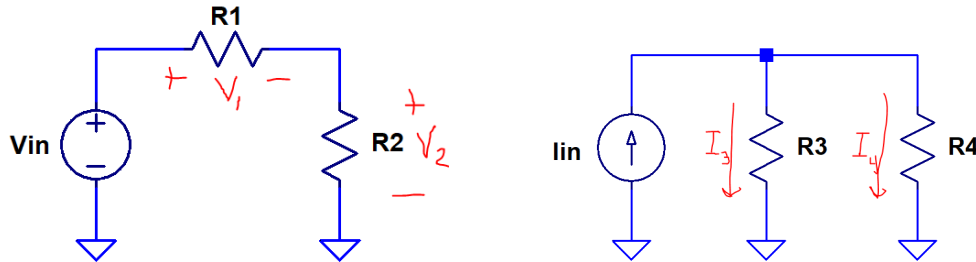


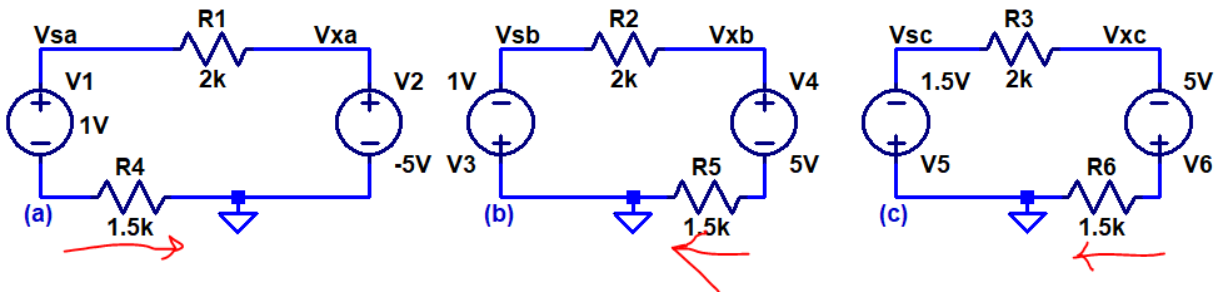
H.W. #1 EE 221 Spring 2021

Show your work for credit and put a box around each of your answers (follow the hw guidelines!)

1. Show how to derive the voltage divider (i.e., $V_1 = V_{in} \cdot (R_1 / (R_1 + R_2))$ and $V_2 = V_{in} \cdot (R_2 / (R_1 + R_2))$) and current divider equations (i.e., $I_3 = I_{in} \cdot (R_4 / (R_3 + R_4))$ and $I_4 = I_{in} \cdot (R_3 / (R_3 + R_4))$) using the following circuits. Show using LTspice and assuming $R_1 = R_4 = 1.5k$, $R_2 = R_3 = 1k$, $V_{in} = 5V$, and $I_{in} = 10mA$, that these equations are correct. (5 points)



2. What happens, in the preceding current divider circuit (how do the current divider equations change), if you put a resistor in series with I_{in} ? Verify your answer with LTspice. (1 point)
3. Find the current flowing in the following circuits in the directions indicated. Also find the voltages V_s and V_x in each circuit. Verify your answers using LTspice. (6 points)



4. Find the voltages V_s , V_x , and the current, in the direction indicated, flowing in the following circuits. Verify your answers with LTspice. (4 points)

