H.W. #1 EE 221 Spring 2023

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., V1 = Vin*(R1/(R1 + R2)) and V2 = Vin*(R2/(R1 + R2))) and current divider equations (i.e., I3 = Iin*(R4/(R3 + R4)) and I4 = Iin*(R3/(R3 + R4))) using the following circuits. Show using LTspice and assuming R1 = R4 = 1.5k, R2 = R3 = 1k, Vin = 5V, and Iin = 10mA, that these equations are correct. (5 points)
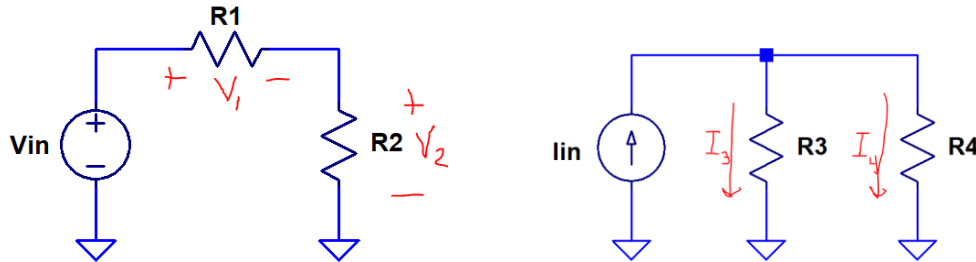
2. What happens, in the preceding current divider circuit (how do the current divider equations change), if you put a resistor in series with Iin? Verify your answer with LTspice. (1 point)

3. Find the current flowing in the following circuits in the directions indicated. Also find the voltages Vs and Vx in each circuit. Verify your answers using LTspice. (6 points)
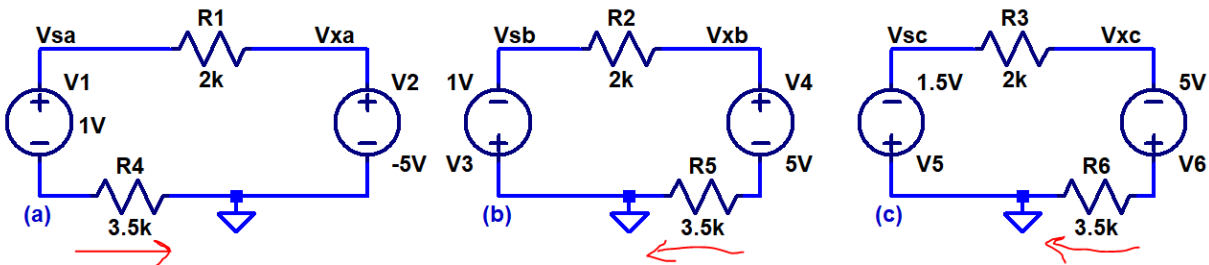
4. Find the voltages Vs, Vx, and the current, in the direction indicated, flowing in the following circuits. Verify your answers with LTspice. (4 points)