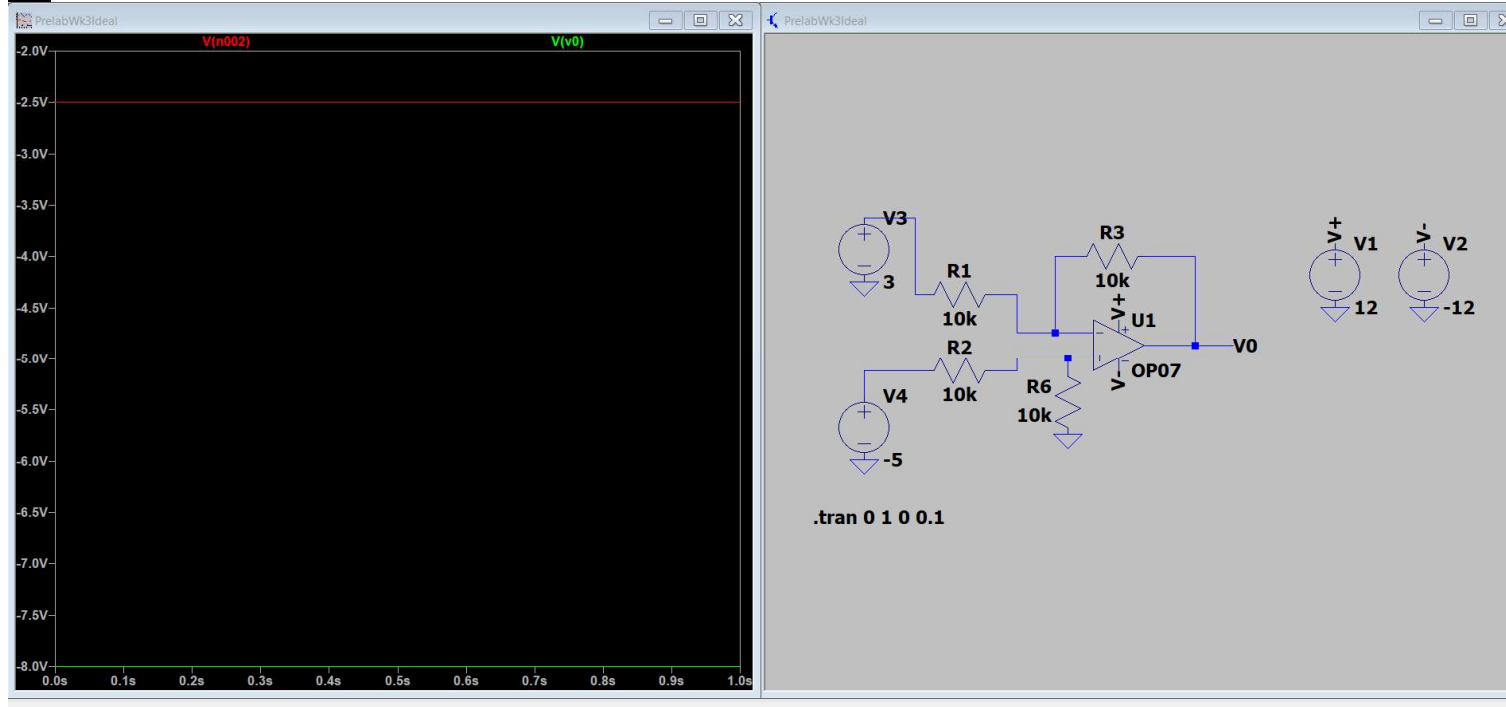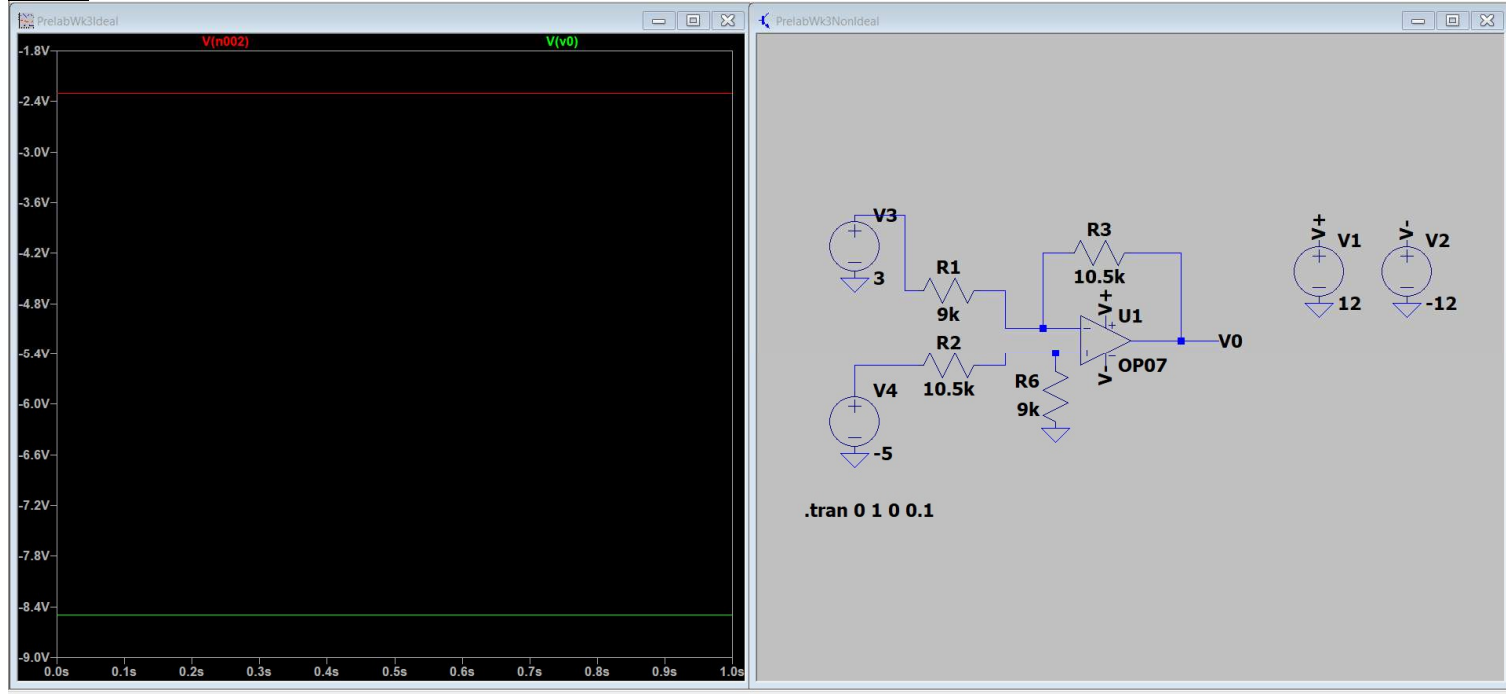# Pre Lab

Monday, February 6, 2023   9:31 AM

Lillian Tucker

Ideal:

Non-Ideal:

Assuming real resistor values have a 5% tolerance, I changed the 10k resistors +- 5 ohms to see what our worst case scenario amplification value would be. Instead of getting -2.5 V for Vin and -8 V for Vout, the non-ideal circuit have Vin as -2.3 V and Vout as -8.5 V which is 0.5 V off the ideal voltage readings. This means, at worst, we can experience around 5% error for our voltage outputs if we anticipate our resistors to have a 5% tolerance.

Op-Amp Differential Amplifier
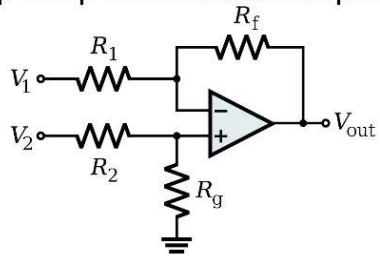
$$V_{\text{out}} = \frac{(R_f + R_1)\, R_g}{(R_g + R_2)\, R_1} V_2 - \frac{R_f}{R_1} V_1$$

If $R_1 = R_2$ and $R_f = R_g$:
$$V_{\text{out}} = \frac{R_f}{R_1}(V_2 - V_1)$$