ECEN 325 – Electronics

Fall 2020

Lab 4: Prelab

Submitted by:

Student Name	UIN:	**Section #**
Michael Mengistu	12500724	**508**

Due: Sept 22st, 2020

1.) $R_3 = 15k\Omega$

$$V_o = -\left(\frac{R_3}{R_1}V_{i1} + \frac{R_3}{R_2}V_{i2}\right)$$

set $\boxed{R_1 = 15k\Omega,\ R_2 = 7.5k\Omega}$

$$V_o = -(V_{i1} + 2V_{i2})$$

2.) $V_o = \frac{R_2}{R_3}(V_{i2} - V_{i1})$, $\frac{R_2}{R_1} = \frac{R_4}{R_3}$, $R_2 = R_3 = R_4 = 10k\Omega$

set $\boxed{R_1 = 10k\Omega}$

$$V_o = V_{i2} - V_{i1}$$

3.) $V_o = \left(1 + \frac{2R}{R_{gain}}\right)(V_{i2} - V_{i1})$, $R_{gain} = 1k\Omega$

$V_o = \left(1 + \frac{R}{500}\right)(V_{i2} - V_{i1})$, set $\boxed{R = 1k\Omega}$

$$V_o = 3(V_{i2} - V_{i1})$$

4.) $V_{i1} = 0.2 \sin(2\pi 1000t)$ and $V_{i2} = 0.3V$

fig-1: $V_o = -(V_{i1} + 2V_{i2})$

$$V_o = -0.8 \sin(2\pi 1000t) V$$

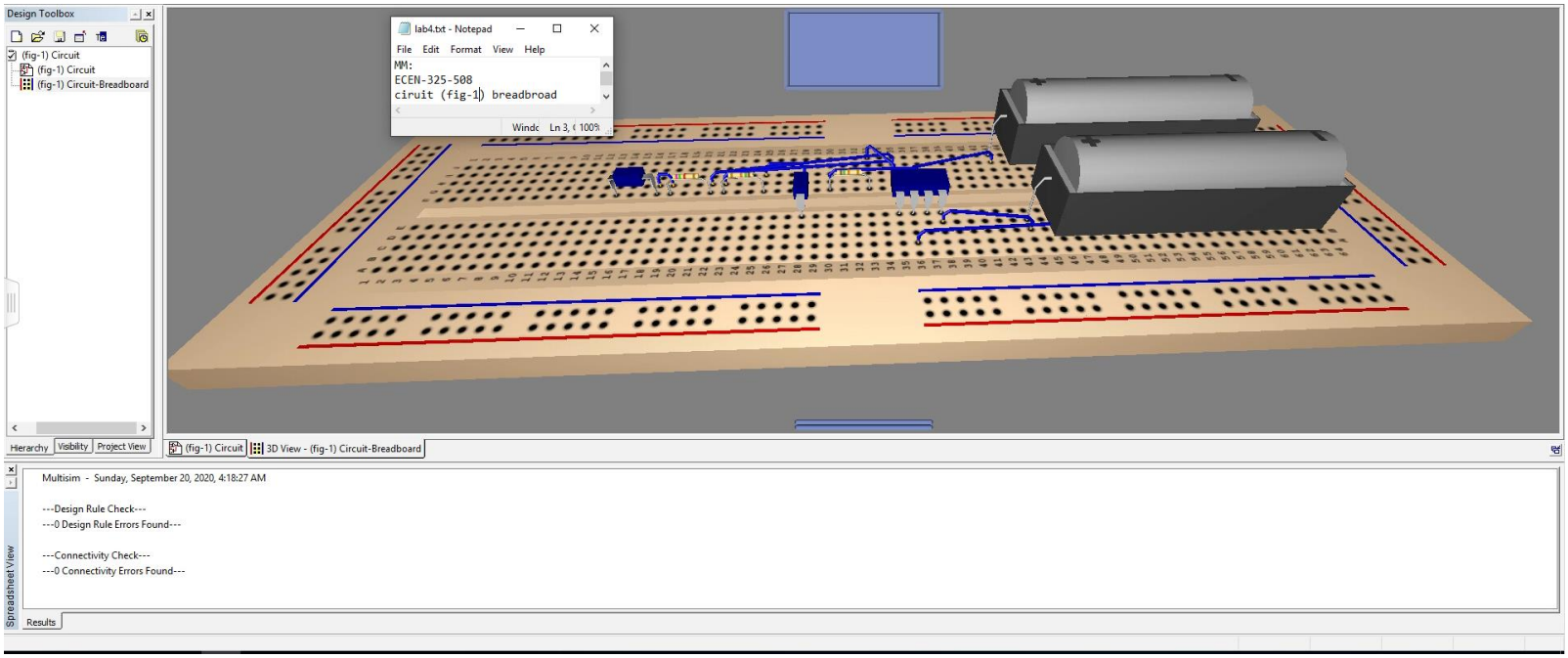
fig-2: $V_o = V_{i2} - V_{i1}$

$$V_o = 0.1 \sin(2\pi 1000t) V$$

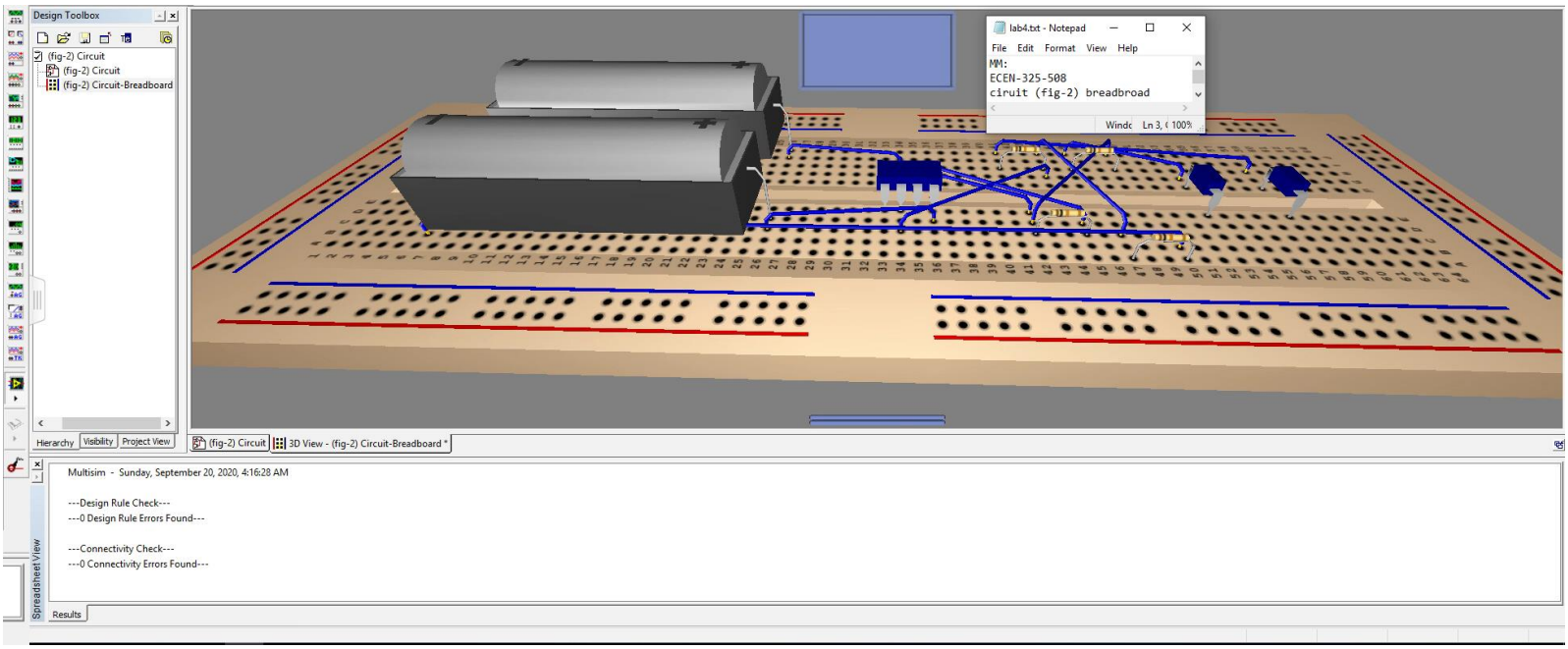
fig-3: $V_o = 3(V_{i2} - V_{i1})$

$$V_o = 0.3 \sin(2\pi 1000t) V$$

(fig-1) Circuit Breadboard



(fig-2) Circuit Breadboard



(fig-3) Circuit Breadboard