Analog IC Lab #1

Hatem Mohamed Ahmed Rashed 20010447
Ziad Amr Ibrahim Mohamed 20010637

1 Practical Results

1.1 Unity Gain Amplifier
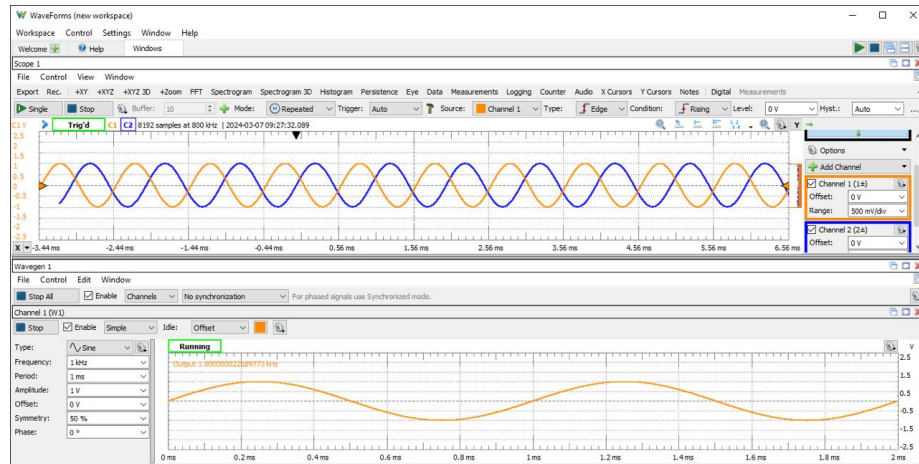

Figure 1: The prictical result plot for Unity Gain Amplifier

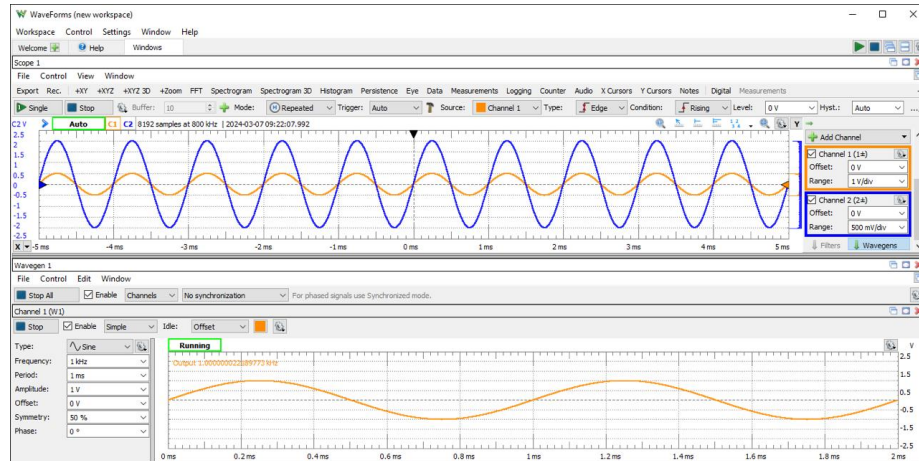## 1.2 Non Inverting Amplifier with Gain of 2

Figure 2: The prictical result plot for Non Inverting Amplifier with Gain of 2
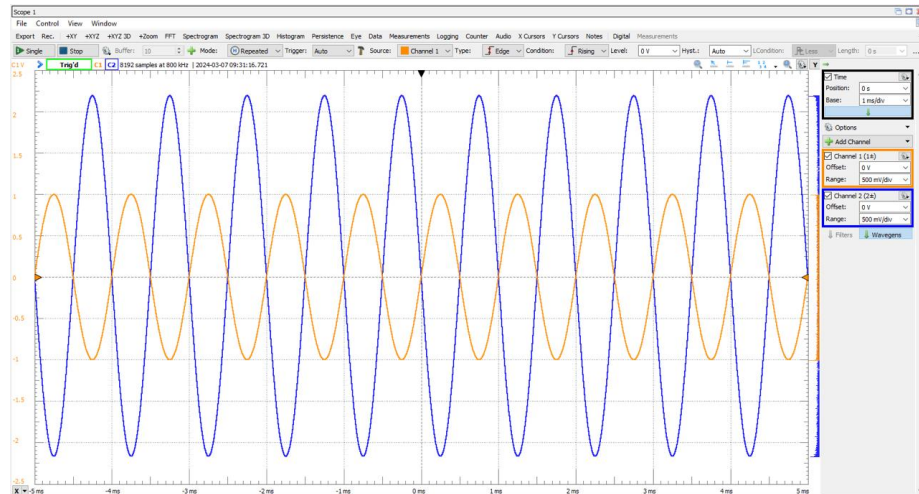
1.3 Inverting Amplifier with Gain of 2.2

Figure 3: The prictical result plot for Inverting Amplifier with Gain of 2.2

2 Simulation Results

2.1 Unity Gain Amplifier
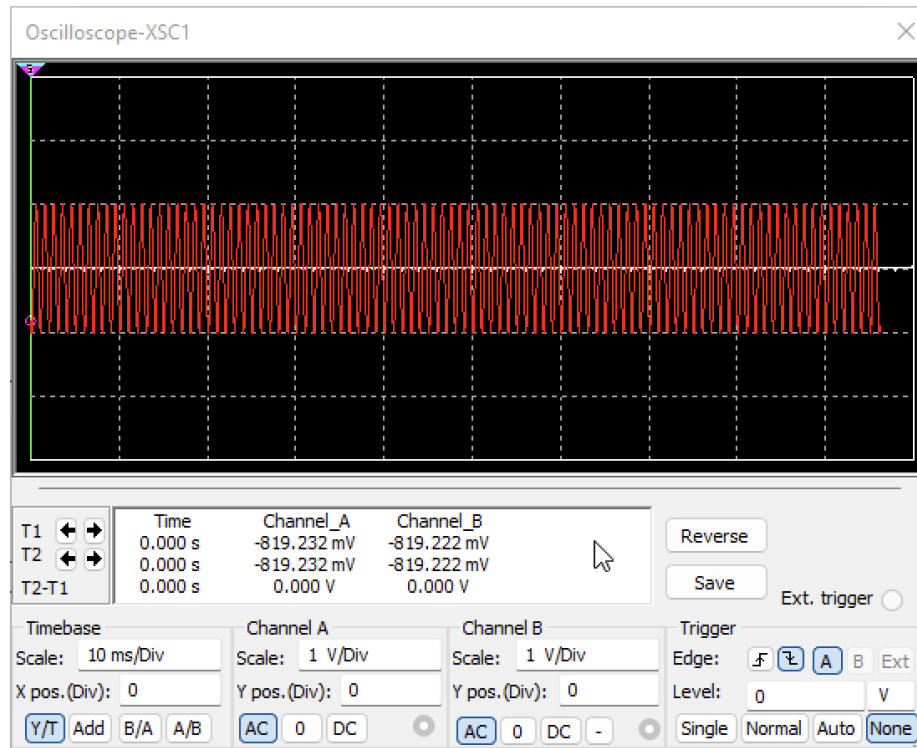
2.1.1 Unity Sine Gain

Figure 4: The simulation plot for Unity Sine Gain
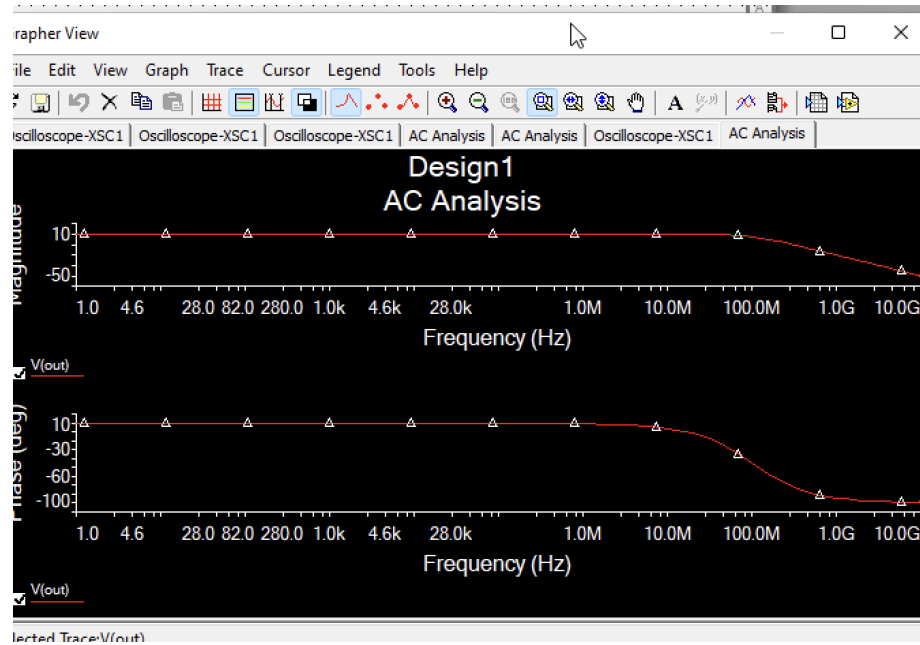
2.1.2 Unity Sine Frequency

Figure 5: The simulation plot for Unity Sine Freq
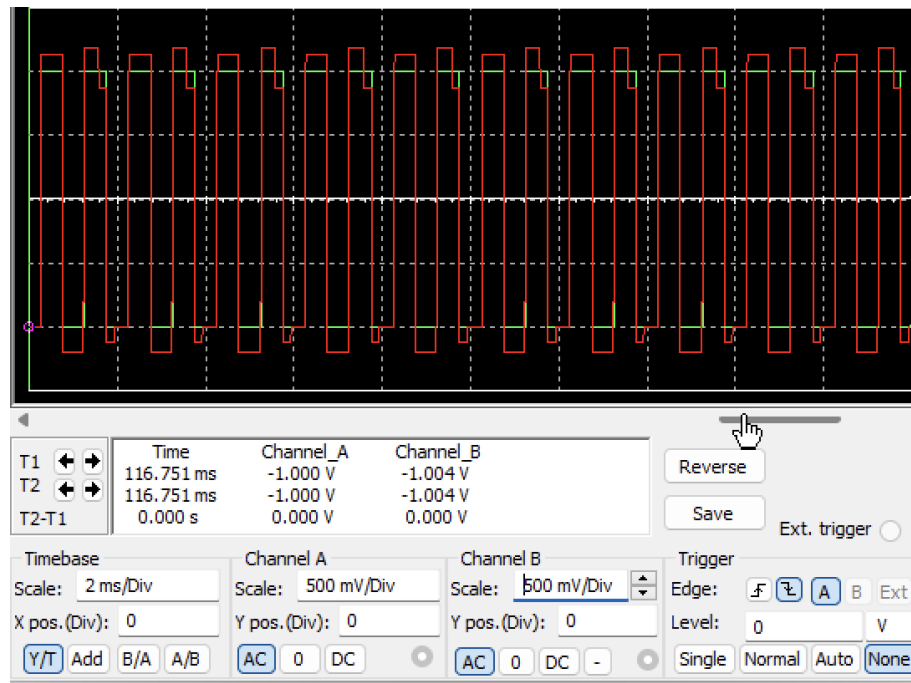
2.1.3 Unity Square Gain

Figure 6: The simulation plot for unity Unity Square Gain
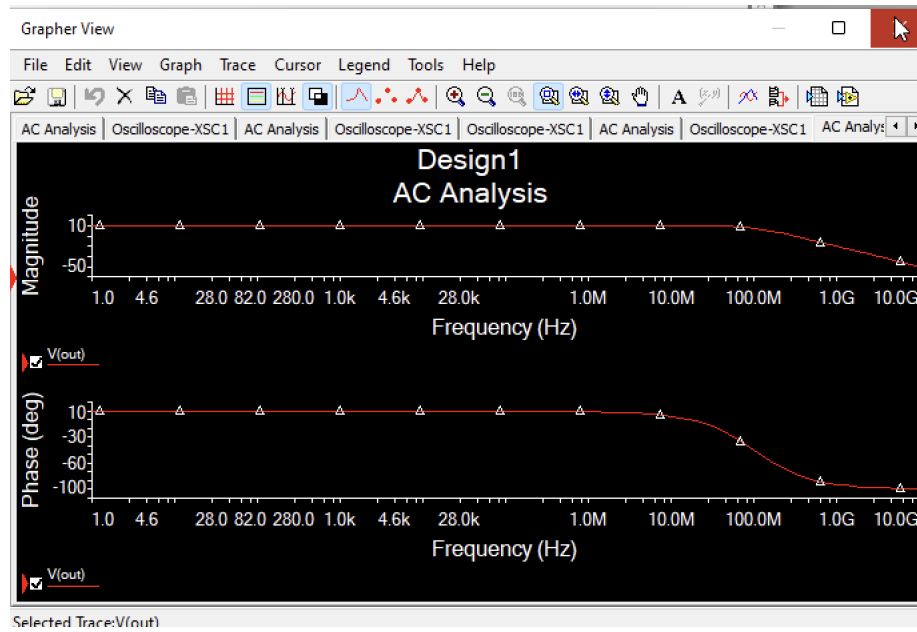
2.1.4 Unity Square Frequency

Figure 7: The simulation plot for Unity Square Freq

2.2   Non Inverting Amplifier
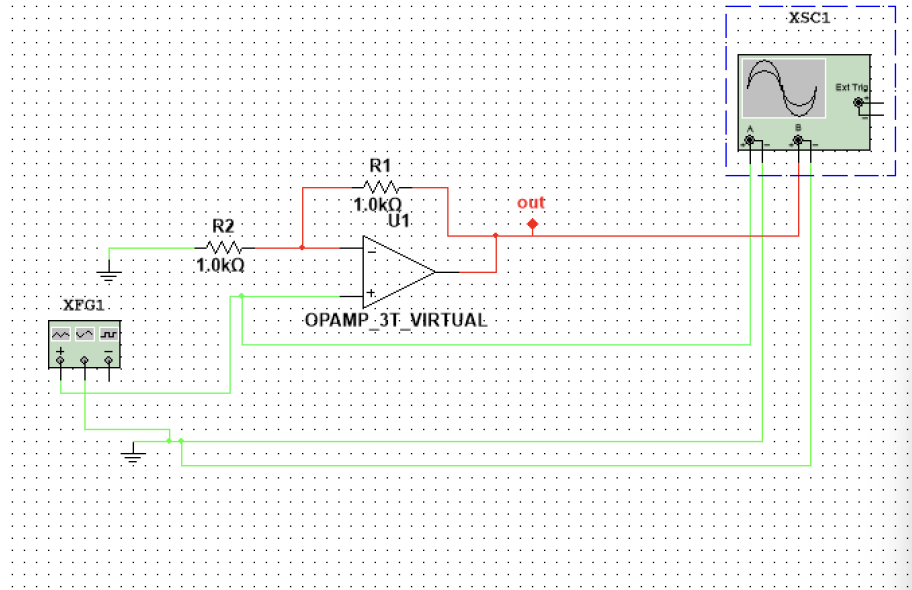
2.2.1   Non Inverting Amplifier Circuit

Figure 8: The simulation plot for Non Inverting Amplifier circuit

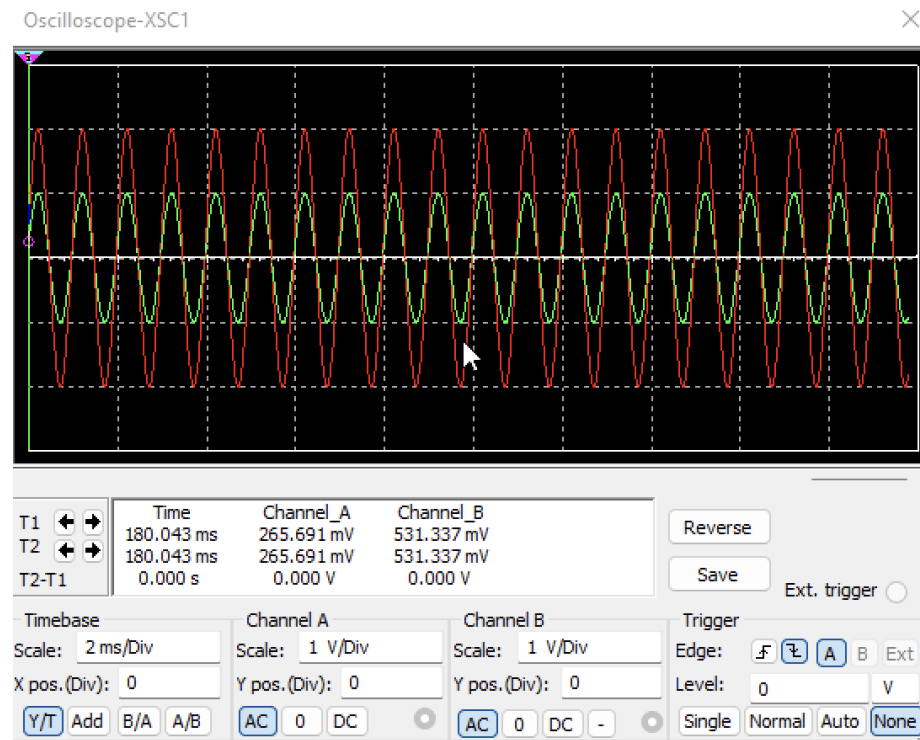### 2.2.2 Non Inverting Amplifier Sine Gain

Figure 9: The simulation plot for Non Inverting Amplifier Sine Gain
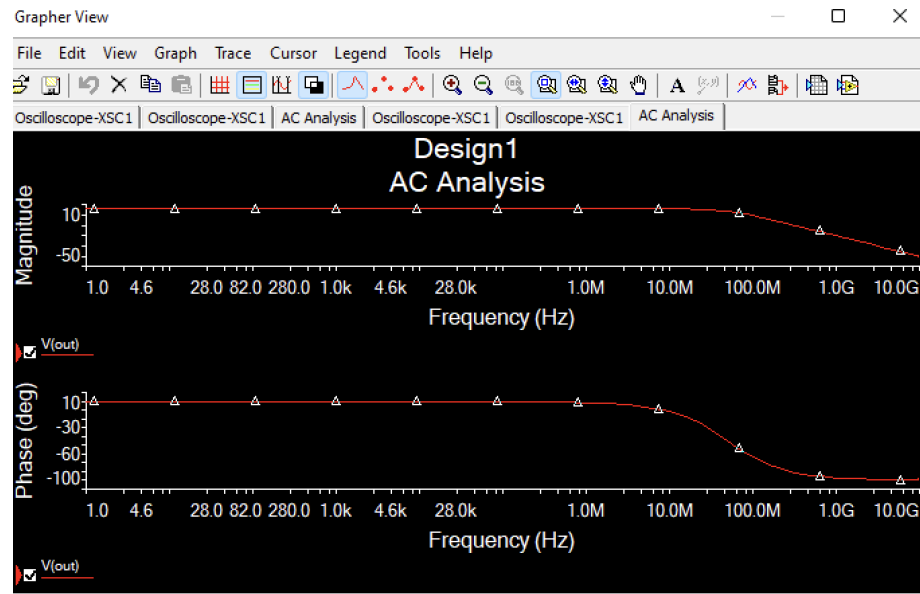
2.2.3   Non Inverting Amplifier Sine Frequency

Figure 10: The simulation plot for Non Inverting Amplifier Square Gain

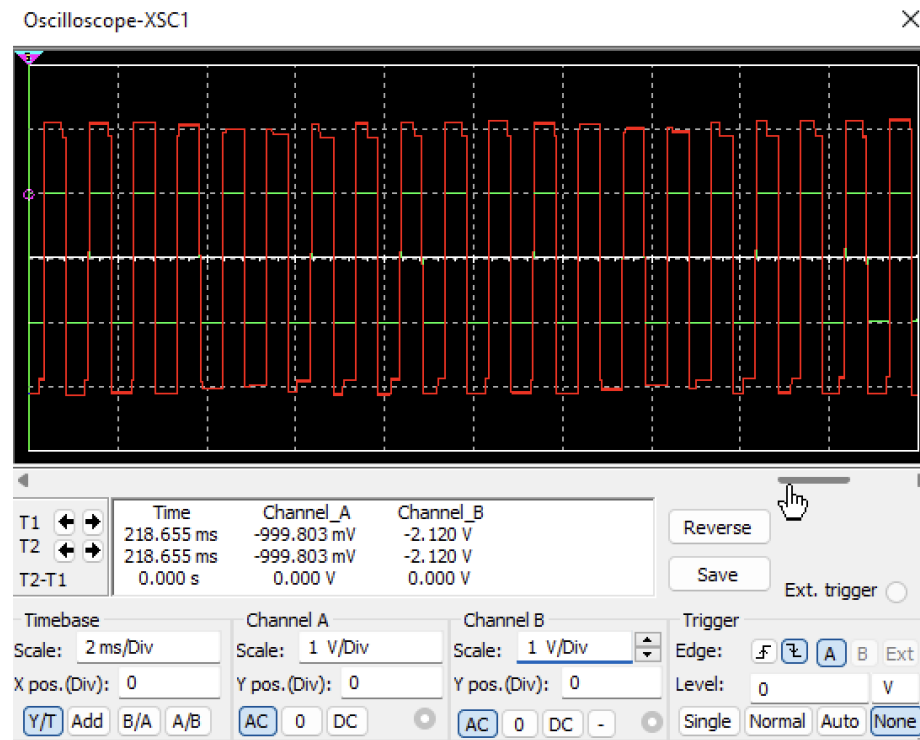### 2.2.4 Non Inverting Amplifier Square Gain

Figure 11: The simulation plot for Non Inverting Amplifier Square Gain

2.2.5 Non Inverting Amplifier Square Frequency
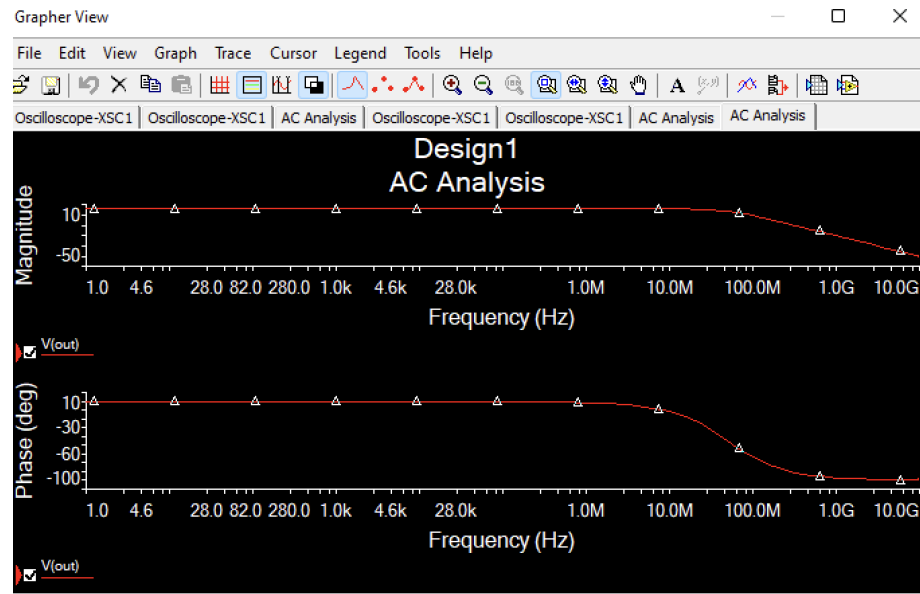

Figure 12: The simulation plot for Non Inverting Amplifier Square Frequency

2.3   Inverting Amplifier
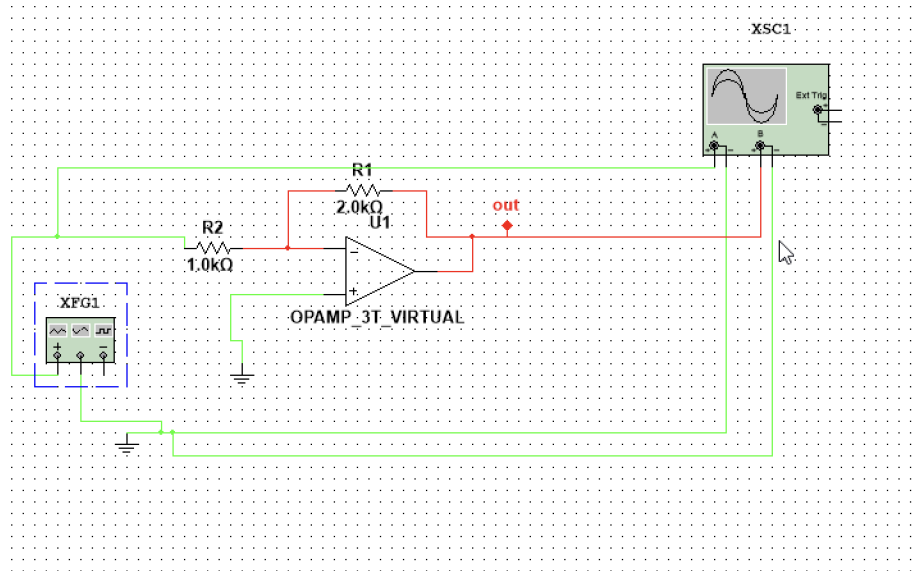
2.3.1   Inverting Amplifier Circuit

Figure 13: The simulation plot for Inverting Amplifier circuit

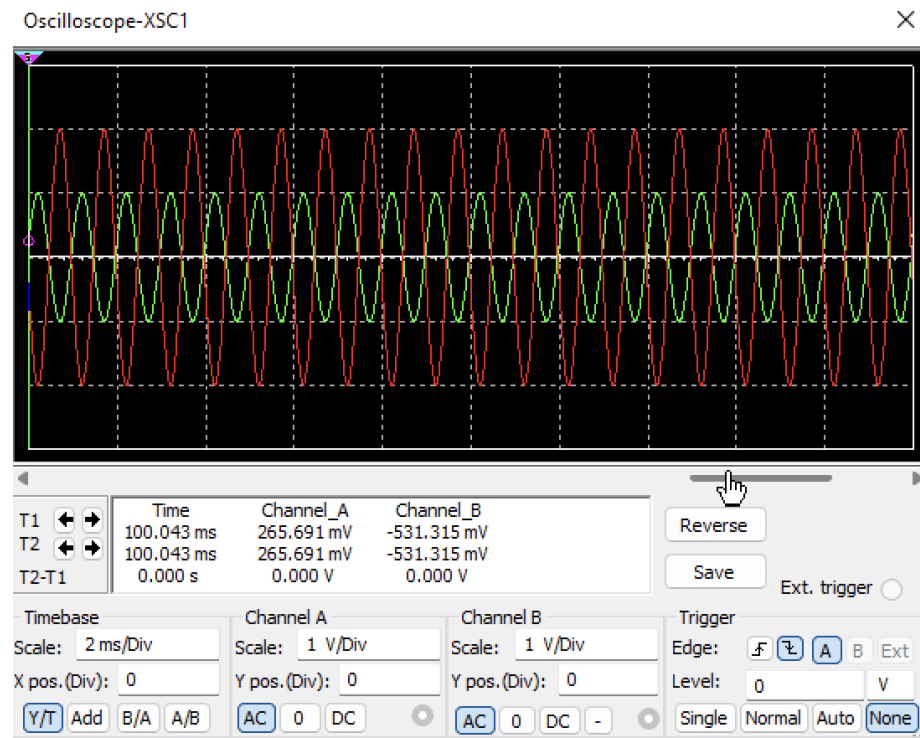### 2.3.2 Inverting Amplifier Sine Gain

Figure 14: The simulation plot for Inverting Amplifier Sine Gain

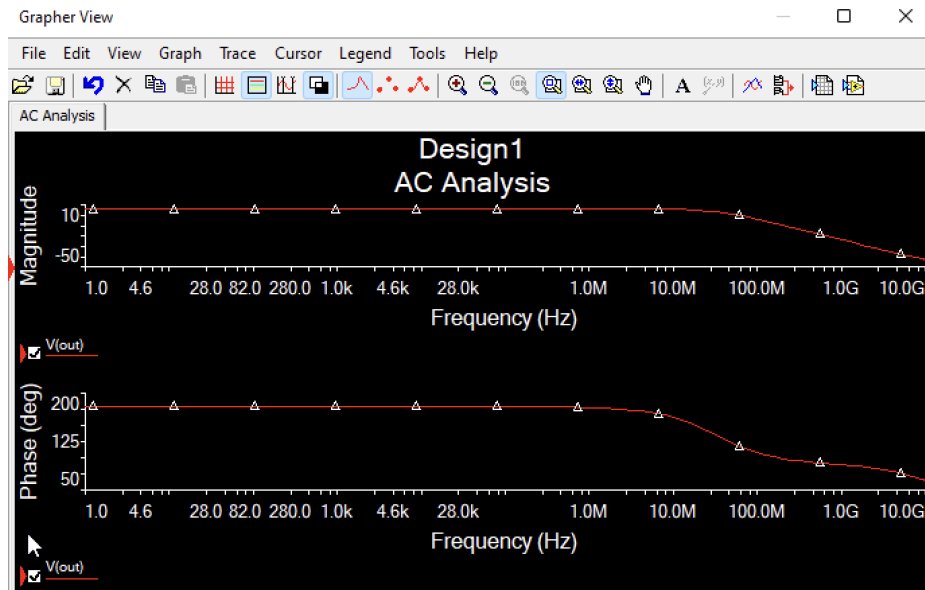### 2.3.3 Inverting Amplifier Sine Frequency

Figure 15: The simulation plot for Inverting Amplifier Square Gain

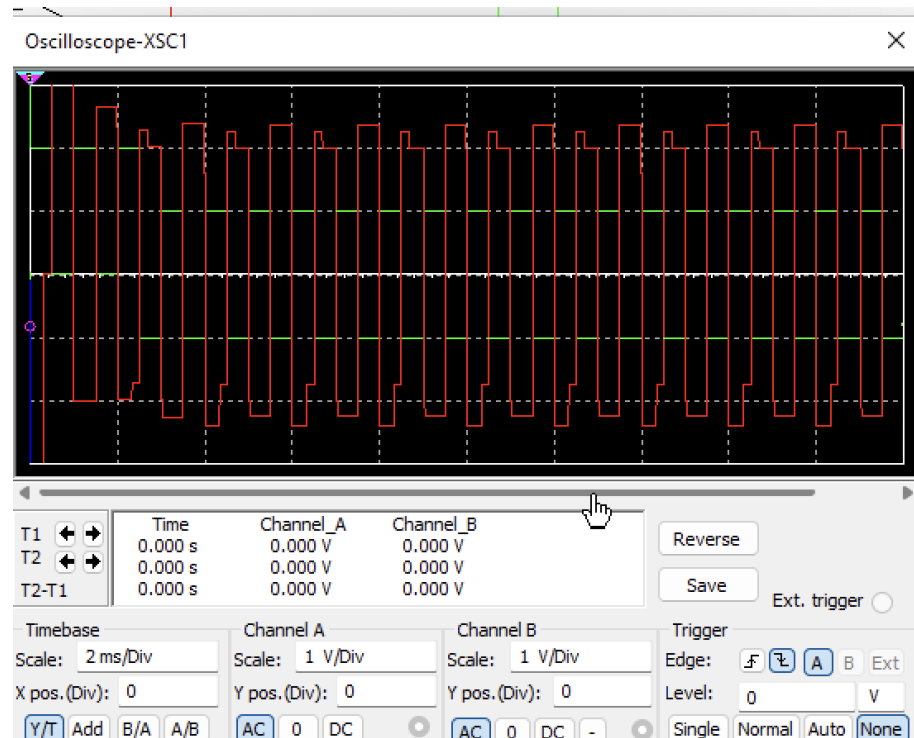### 2.3.4   Inverting Amplifier Square Gain

Figure 16: The simulation plot for Inverting Amplifier Square Gain
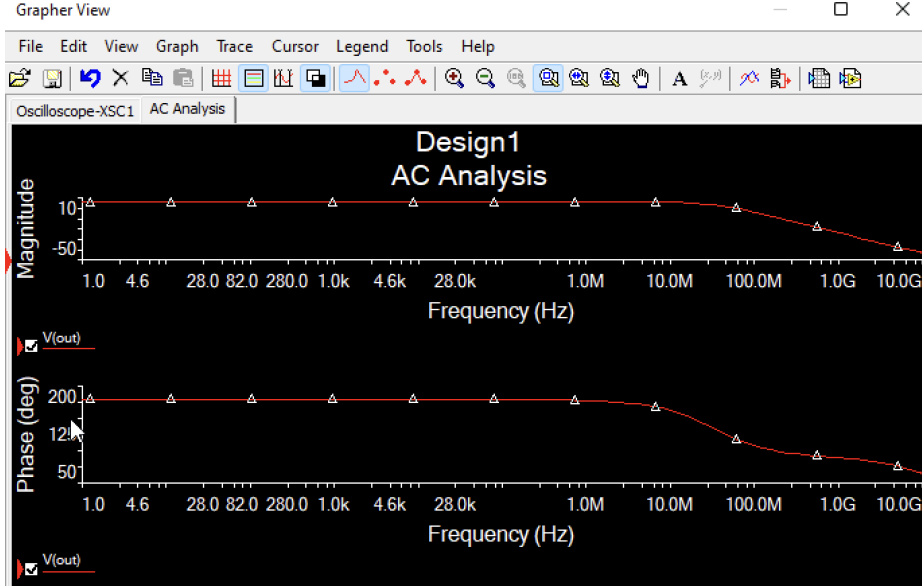
2.3.5 Inverting Amplifier Square Frequency

Figure 17: The simulation plot for Inverting Amplifier Square Frequency

3 Instrumentation Amplifier

3.1 instrumentation Amplifier with gain of 3

3.1.1 Procedures

the procedures taken for this experment are to get a gain of 3

$$V_{input1} = 1volt, \quad Freq_{input1} = 1kHz \tag{1}$$

$$V_{input2} = 1.5volt, \quad Freq_{input2} = 1kHz \tag{2}$$

$$A_v = \left(1 + \frac{2R}{R*n}\right) * \frac{R}{R} = 3 \tag{3}$$

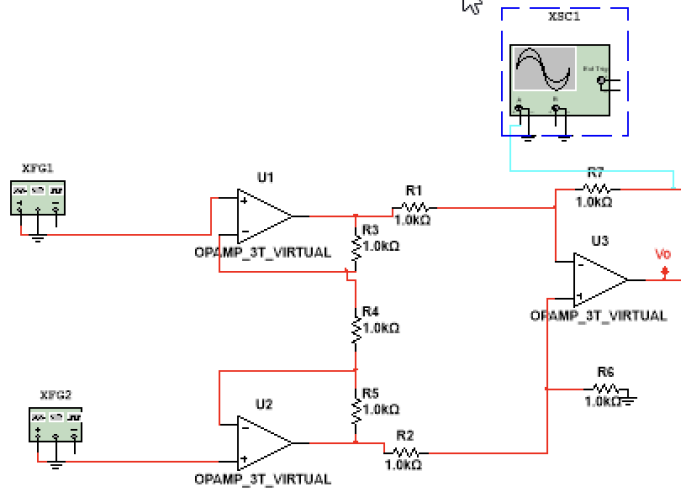### 3.1.2 instrumentation Amplifier Circuit with input sine wave

Figure 18: The simulation plot for instrumentation Amplifier Circuit with input sine wave

3.1.3 Output

3.1.4 instrumentation Amplifier output

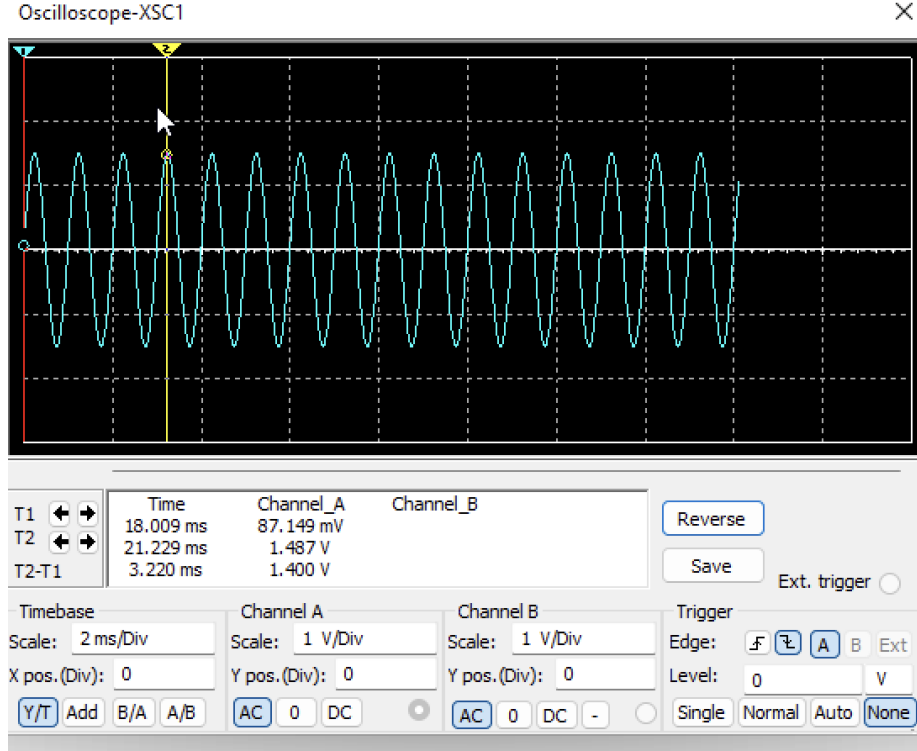$$V_{out} = (1.5 - 1) * 3 = 1.5 volts \tag{4}$$

Figure 19: The simulation plot for instrumentation Amplifier Square output

3.2 instrumentation Amplifier with gain of 5

3.2.1 Procedures

the procedures taken for this experment are to get a gain of 5

$$V_{input1} = 1volt, \quad Freq_{input1} = 1kHz \tag{5}$$

$$V_{input2} = 1.5volt, \quad Freq_{input2} = 1kHz \tag{6}$$

$$A_v = \left(1 + \frac{R}{R} + \frac{2R}{R*n}\right) = 5 \tag{7}$$

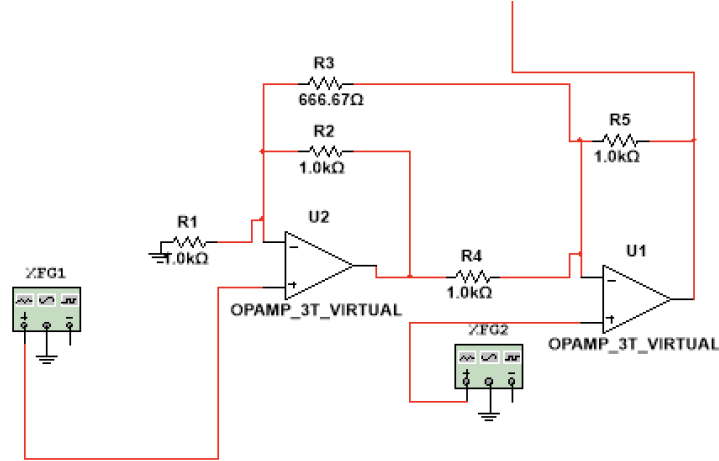### 3.2.2   instrumentation Amplifier Circuit with input sine wave

Figure 20: The simulation plot for instrumentation Amplifier Circuit with input sine wave

3.2.3   Output

3.2.4   instrumentation Amplifier output

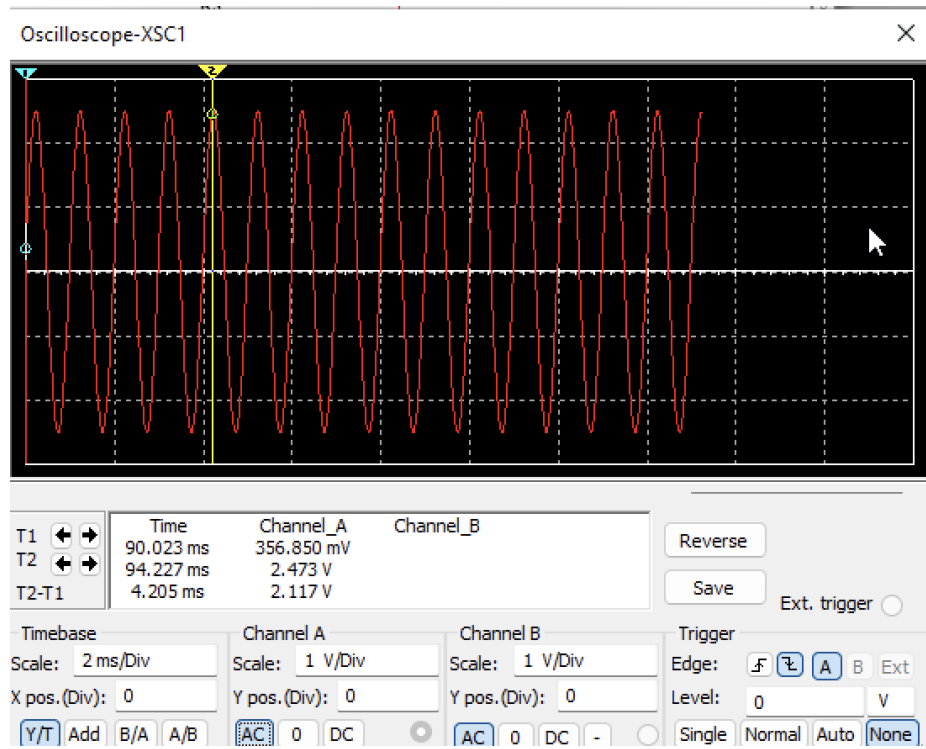$$V_{out} = (1.5 - 1) * 5 = 2.5 volts \tag{8}$$

Figure 21: The simulation plot for instrumentation Amplifier Square output