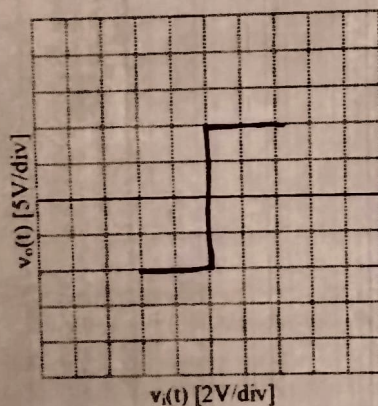
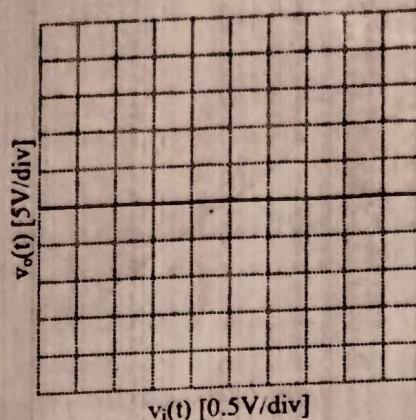


Graph 2.0 (0.5 marks)



Graph 3.0 (0.5 marks)

- (e) Step 5: Change the values of both the positive & negative dc-supply voltages to +15V and -15V, respectively, and modify your circuit as shown in Figure 3.0. Negative feedback is now said to be applied around the Op-Amp, with feedback factor $\beta = R_1/(R_1 + R_2)$, and the circuit is said to operate as a non-inverting amplifier. Plot the resulting voltage-transfer characteristics on Graph 4.0. Record feedback factor β in Table 1.0. Use your graph to record the Dynamic Range and Voltage Gain also in Table 1.0. (The Dynamic Range is the linear region of the voltage-transfer characteristics.)
- (f) Step 6: This concludes the first 3-hr lab session. Please demonstrate Step 1 to Step 5 to your TA and submit your answers to the prelab assignments and the results collected from Step 1 to Step 5 to your TA at the end of the lab session. (1 mark)



Graph 4.0 (0.5 marks)

Table 1.0 (0.5 marks)

Circuit Conditions	Feedback Factor $\frac{R_1}{R_1 + R_2}$	Valid Input Range (Dynamic Range) for $v_i(t)$	Voltage Gain $[v_o(t)/v_i(t)]$
Negative feedback [$R_1=10k\Omega$ & $R_2=100k\Omega$]	0.091	$-1.25 < R < 1.25$	$\frac{28}{2.5} = 11.4$
Negative feedback [$R_1=10k\Omega$ & $R_2=47k\Omega$]			
Negative feedback [$R_1=\infty$ & $R_2=0$]			

- (g) Step 7: Replace R_2 with a $47k\Omega$ resistor on the Figure 3.0 circuit. Use Graph 4.0 to plot the resulting XY-mode voltage transfer curve. Use your plot to fill-in Table 1.0.
- (h) Step 8: By replacing the resistor R_1 with an open-circuit and the resistor R_2 with a short-circuit, your circuit is now said to operate as a voltage follower. Use Graph 4.0 to plot the resulting voltage-transfer curve, and fill-in the blanks in Table 1.0.
- (i) Step 9: Modify your circuit as shown in Figure 4.0. The circuit is now said to operate as an inverting amplifier. Use Graph 5.0 to plot the resulting voltage-transfer characteristics and fill-in the blanks in Table 2.0.
- (j) Step 10: Replace R_2 with a $47k\Omega$ resistor. Use Graph 5.0 to plot the resulting voltage transfer curve. Use your plot to fill-in the blanks in Table 2.0.
- (k) Step 11: Demonstrate Step 7 to Step 10 to your TA. (1 mark)