

# **Basic Electronic Circuits Lab**

## **(IEC-103)**

### **Experiment-02**

# Objective

**To study the transfer characteristics of an inverting and non-inverting amplifier built using op-amp.**

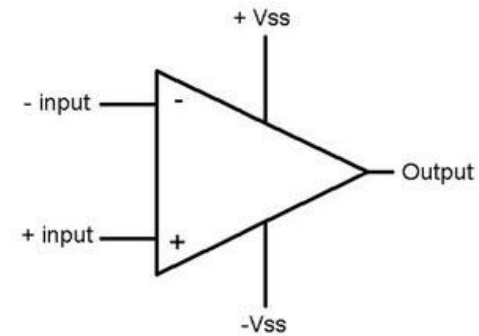
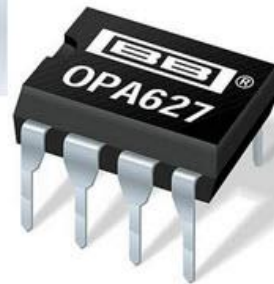
# Components

- **Op-amp IC (741)**
- **Resistances ( $1\text{k}\Omega$  and  $4.7\text{ k}\Omega$ )**
- **Breadboard**
- **Connecting wires**

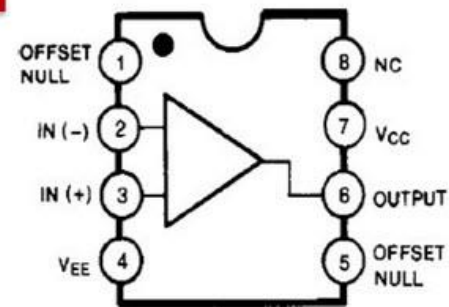
# Equipment

- **Function Generator for generating input signal.**
- **Power supplies ( $\pm 12\text{ V}$ ) to power up op-amp.**
- **CRO for input and output voltage measurements**

# 741 Op Amp IC

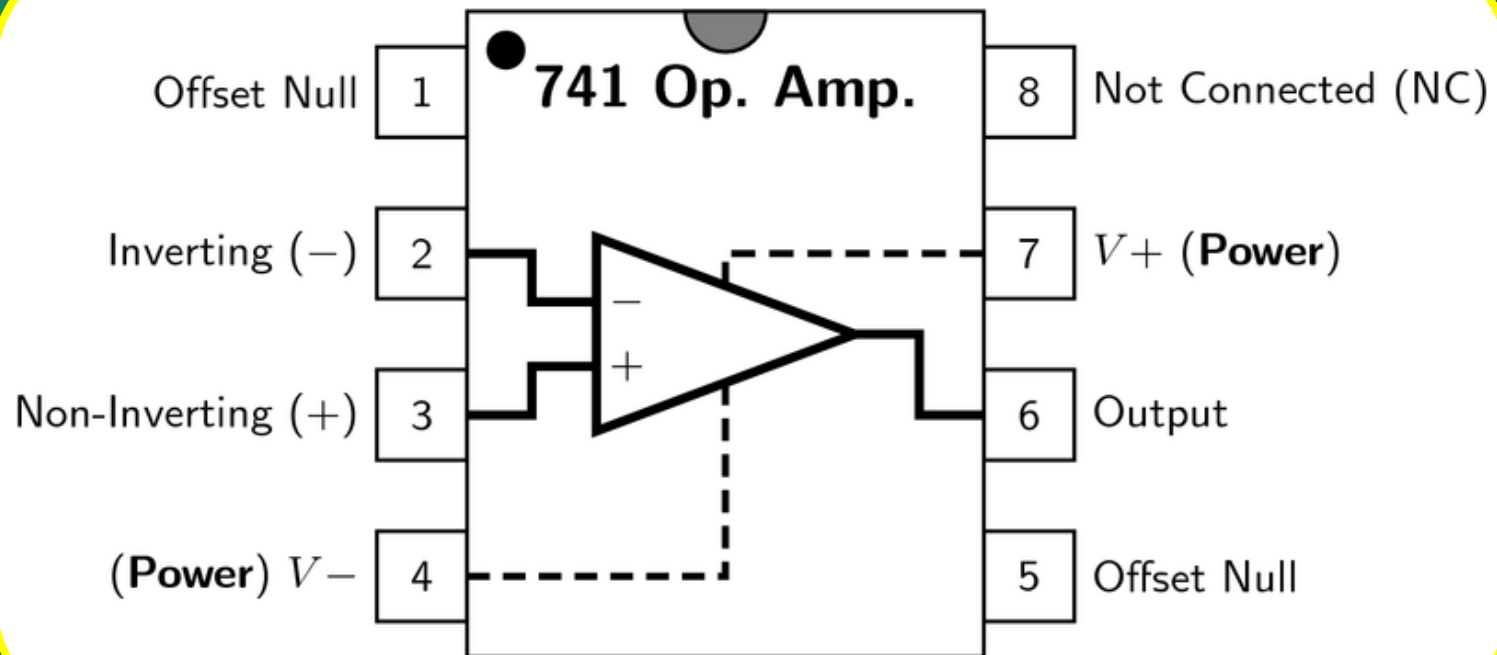


## OP-AMP

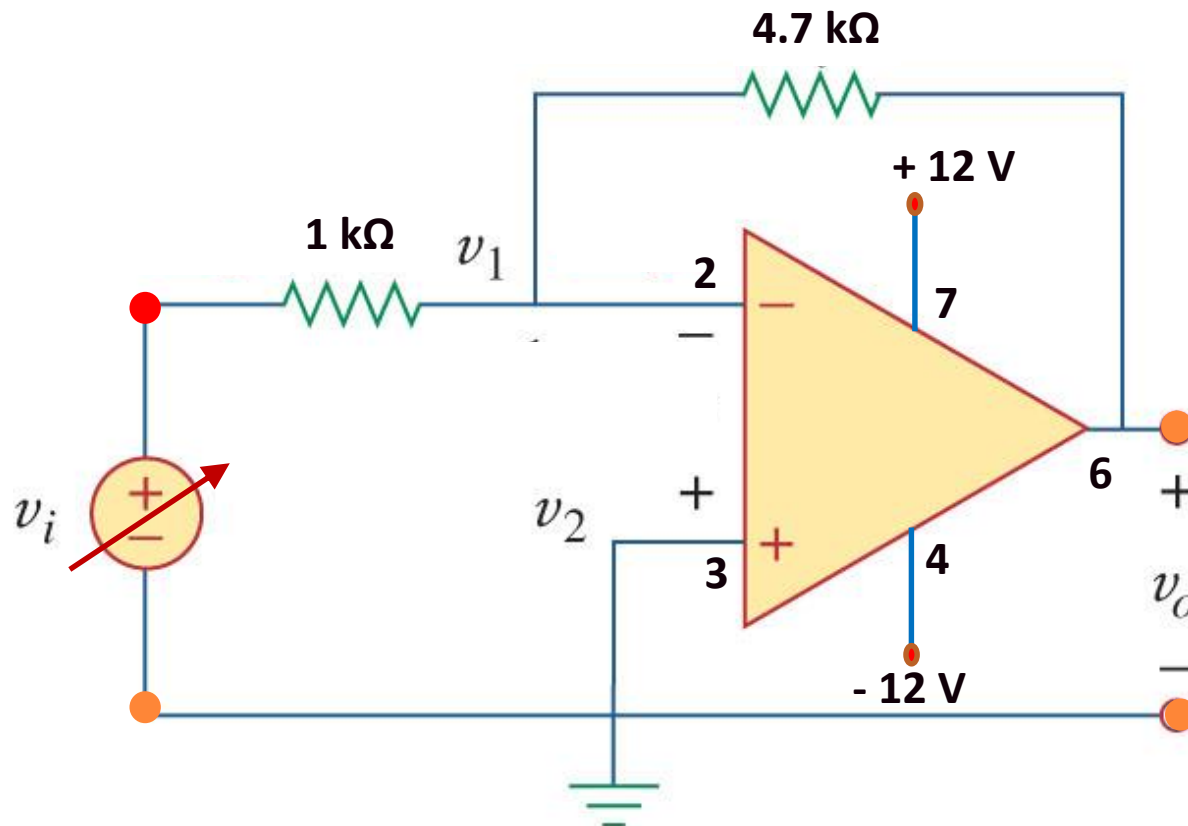




# 741 Op Amp IC (Pin Diagram)



# Inverting Amplifier



# Inverting Amplifier

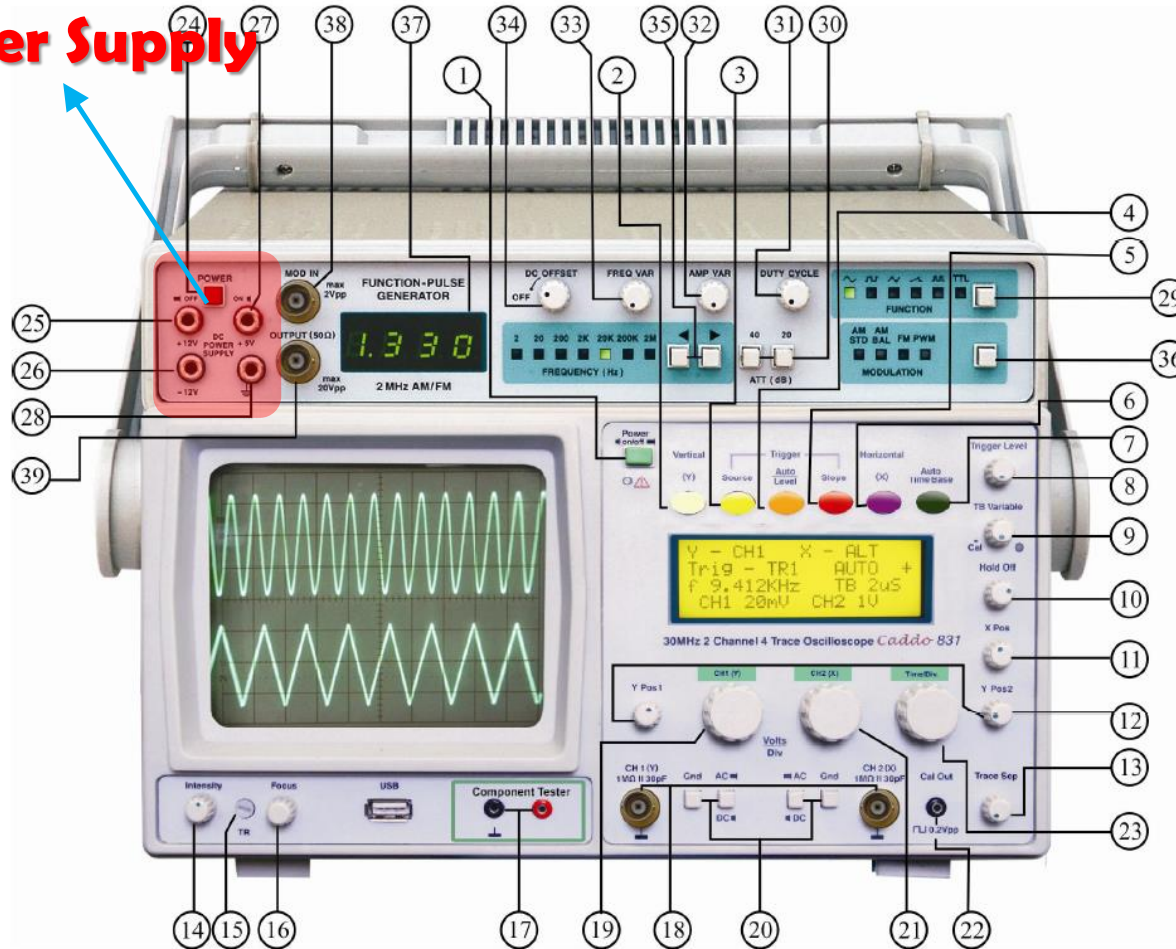
**Output voltage**

$$V_o = -\left(\frac{4.7k}{1k}\right)V_i = 4.7V$$

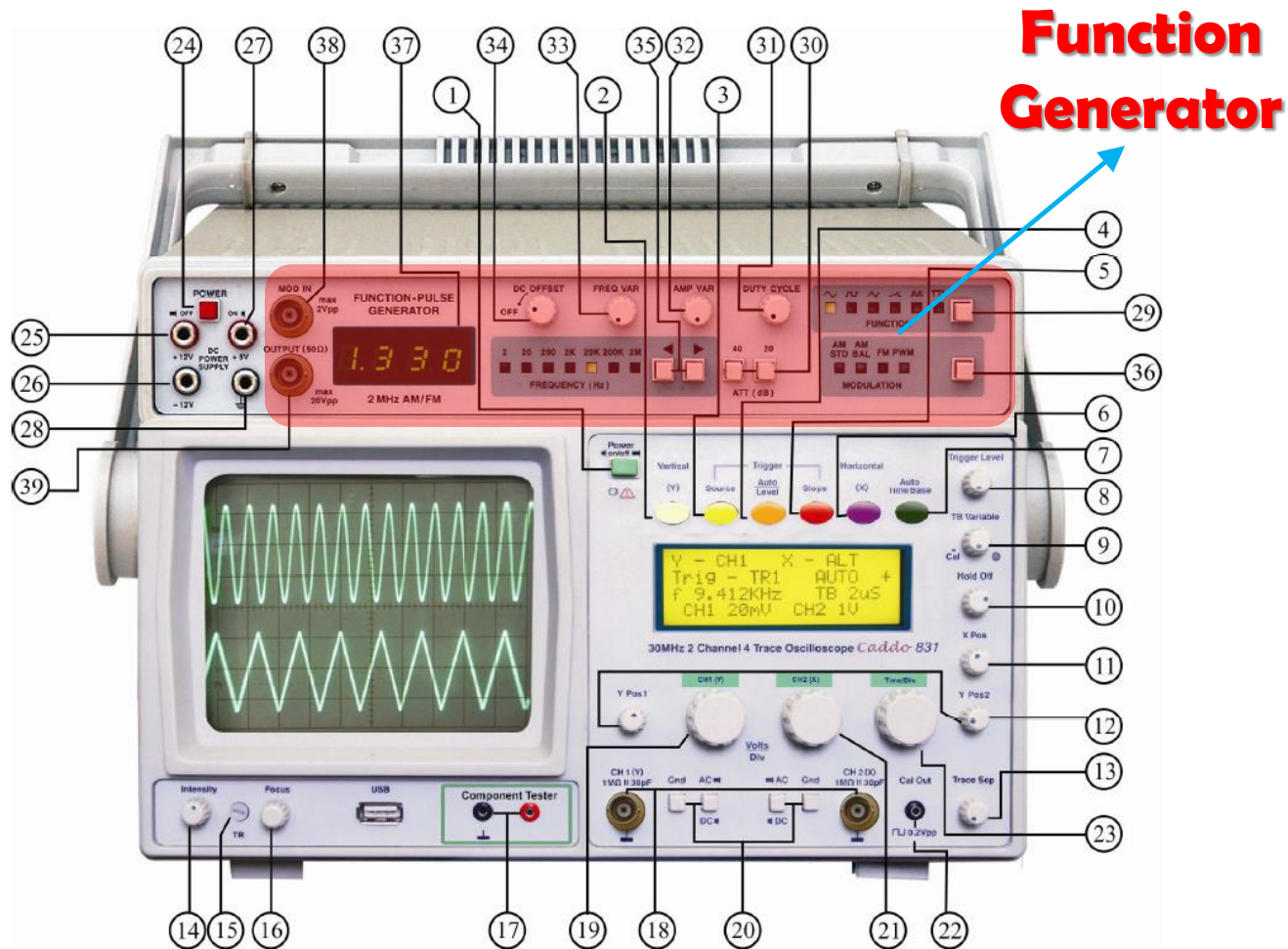


# Power Supply (Fixed)

Power Supply

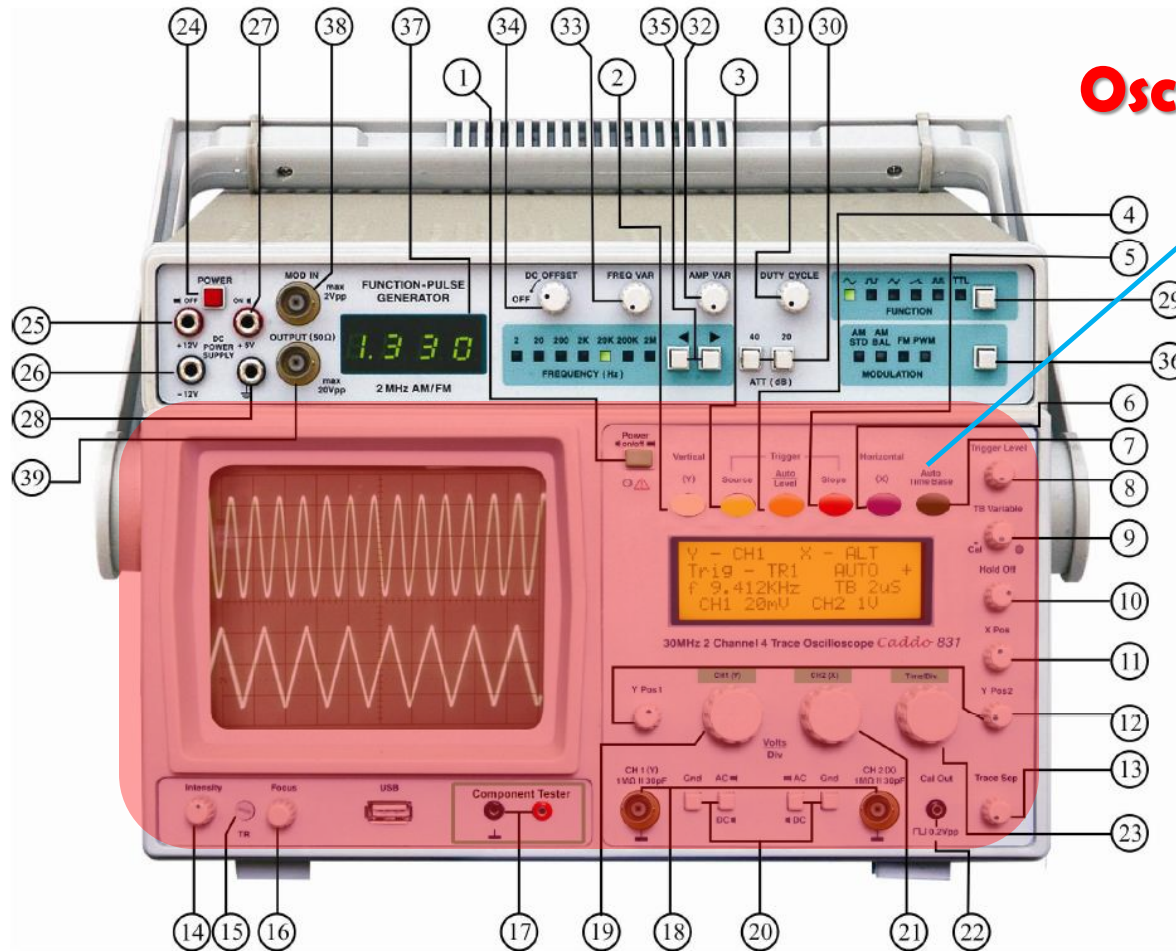


# Signal Source



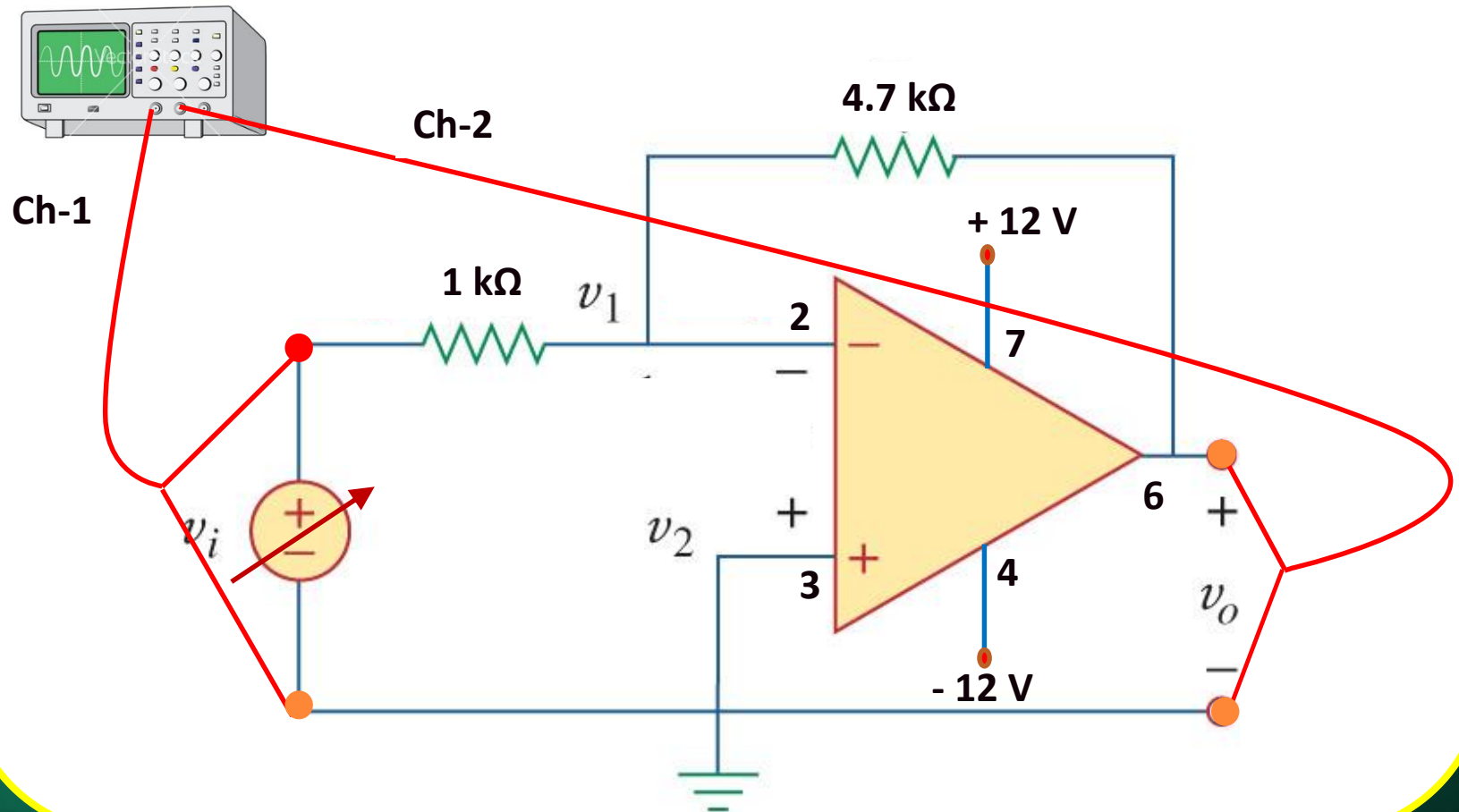


# Oscilloscope



**Oscilloscope**

# Input & Output Voltage Measurements



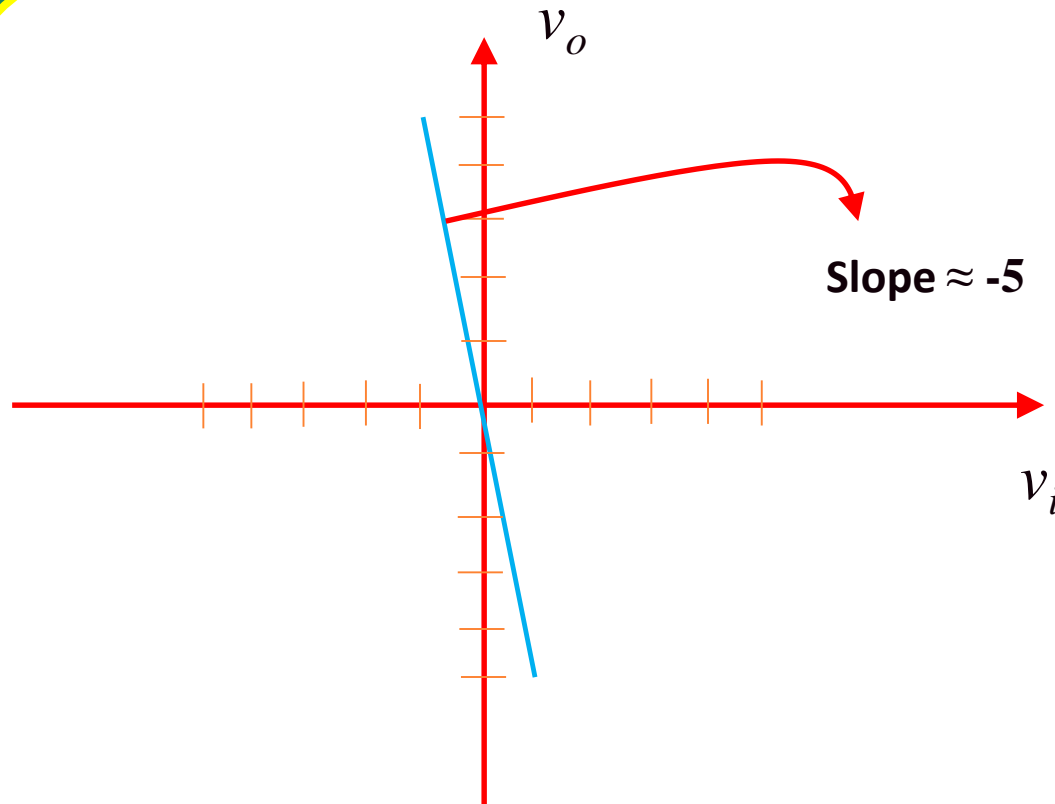
# Observations

**Frequency of the input signal is 1 kHz.**

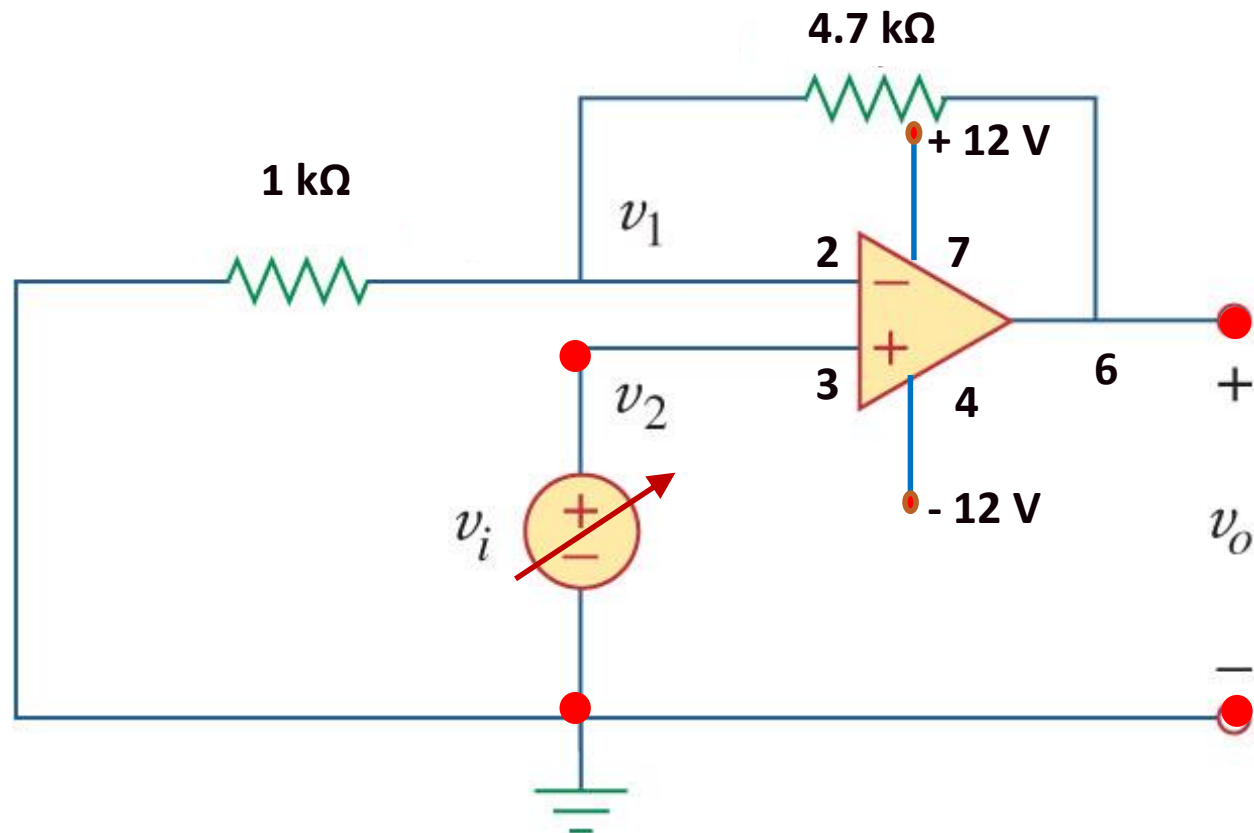
S. No	$V_i$ (volt) (peak)	$V_o$ (volt) (peak)	Gain ( $V_o/V_i$ )
1	0.5		
2	0.75		
3	1		
4	1.25		
5	1.5		



# Transfer Characteristics



# Non-inverting Amplifier

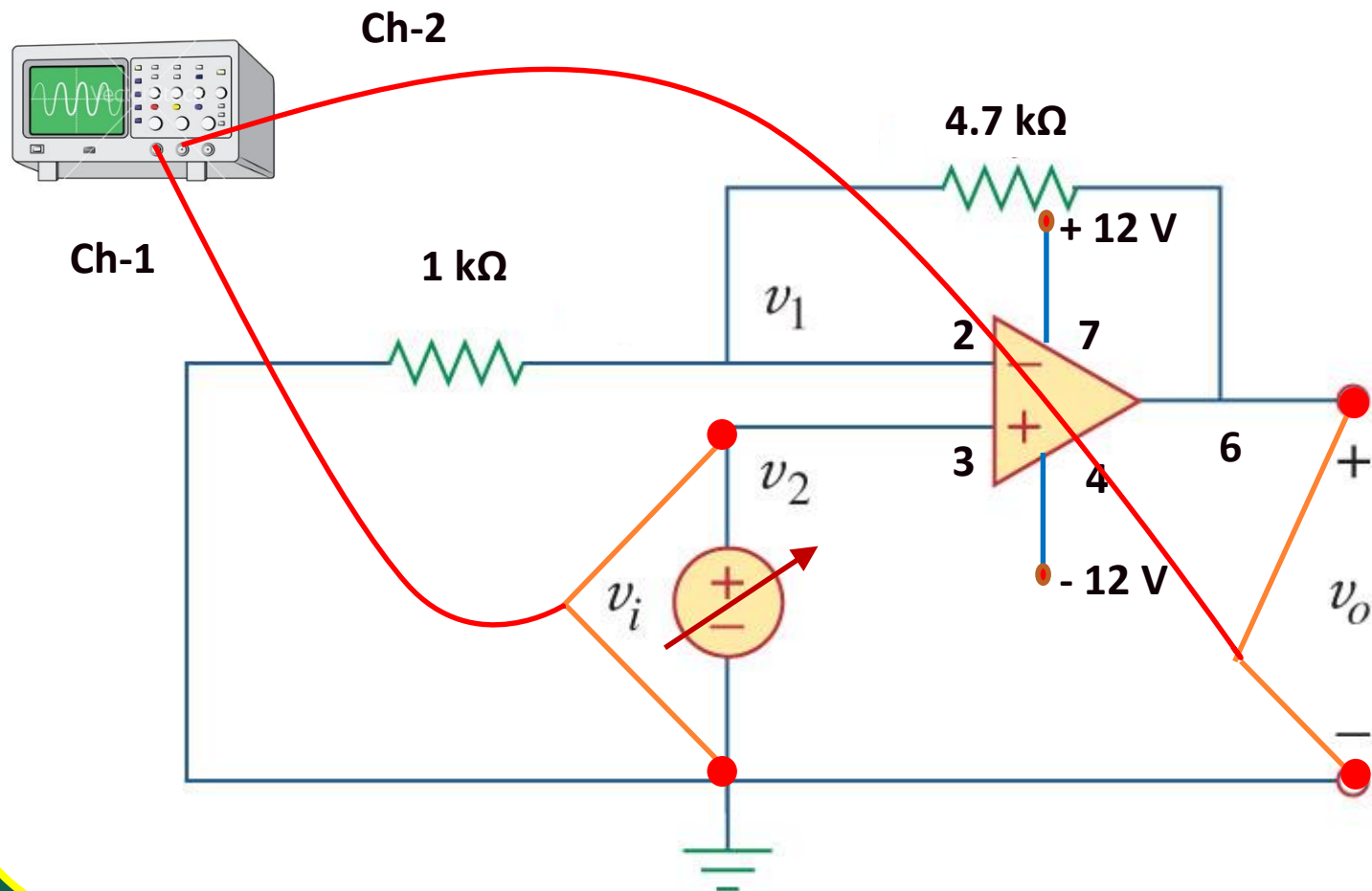


# Inverting Amplifier

**Output voltage**

$$V_o = \left(1 + \frac{4.7k}{1k}\right) V_i = 5.7V$$

# Non-inverting Amplifier



# Observations

**Frequency of the input signal is 1 kHz.**

S. No	$V_i$ (volt) (peak)	$V_o$ (volt) (peak)	Gain ( $V_o/V_i$ )
1	0.5		
2	0.75		
3	1		
4	1.25		
5	1.5		



# Transfer Characteristics

