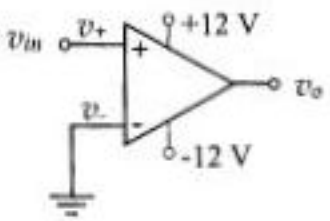
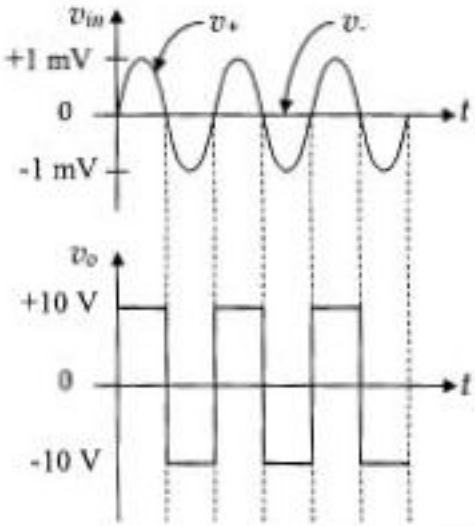
Open Loop Op-Amp Comparator Circuits

1 Simple comparator circuit: open loop (no feedback), no biasing resistors.
   a. Input Vin to V+ (non-inverting) with V- (inverting) grounded.
   b. Input Vin to V- (inverting) with V+ (non-inverting) grounded.

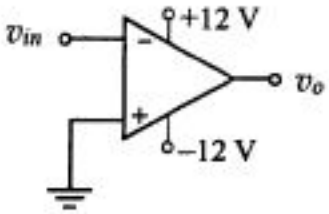
a. Input Vin to V+ (non-inverting) with V- (inverting) grounded.

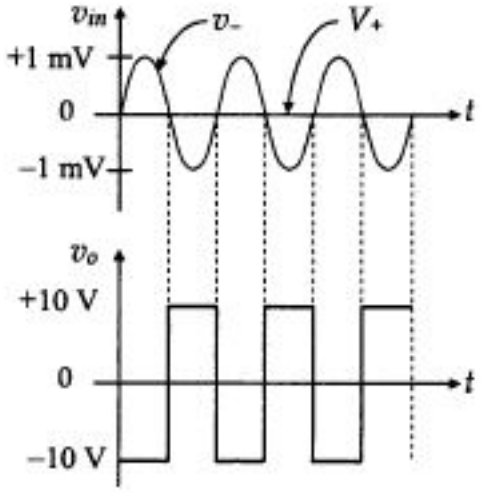




Input and output waveforms of the op-amp

b .Input Vin to V- (inverting) with V+ (non-inverting) grounded.

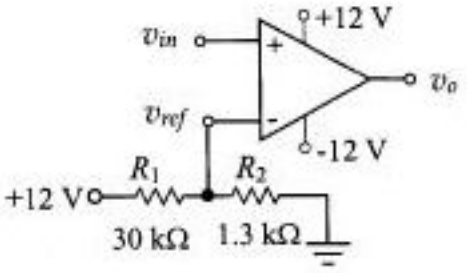




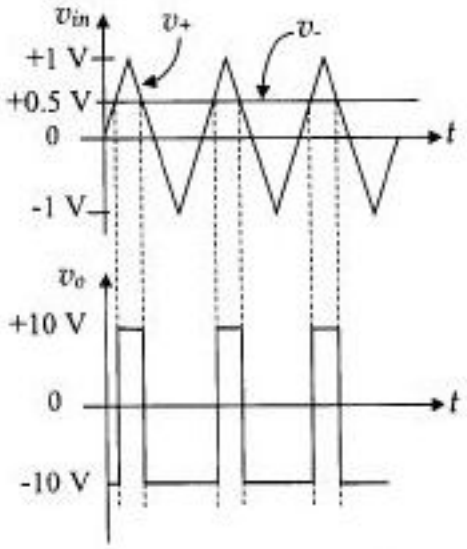
Input and output waveforms

2. Simple comparator circuit: open loop (no feedback), with biasing resistors.
   a. Input Vin to V+ (non-inverting) with V- (inverting) +12 V bias.
   b. Input Vin to V+ (non-inverting) with V- (inverting) -12 V bias.

a. Input Vin to V+ (non-inverting) with V- (inverting) +12 V bias. VSat = VSupply - 2.

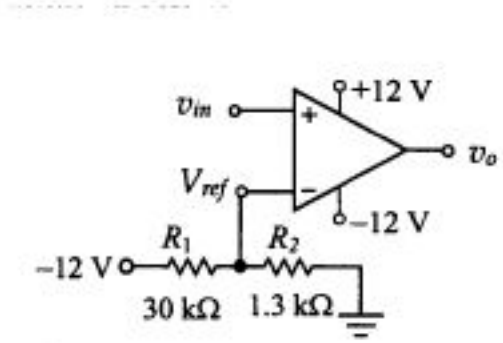


$$v_{ref} = +12\ \text{V}\frac{R_2}{R_1 + R_2} = +0.5\ \text{V}$$

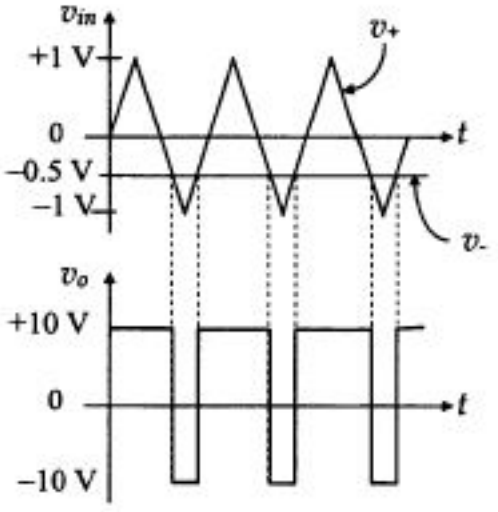


Input and output waveforms

2. Input Vin to V+ (non-inverting) with V- (inverting) -12 V bias. VSat = VSupply - 2.



$$v_{ref} = -12\ \text{V}\frac{R_2}{R_1 + R_2} = -0.5\ \text{V}$$



Input and output waveforms

Source: Electronic Devices: A Design Approach Ali Aminian and Marian Kazimierczuk, 2004