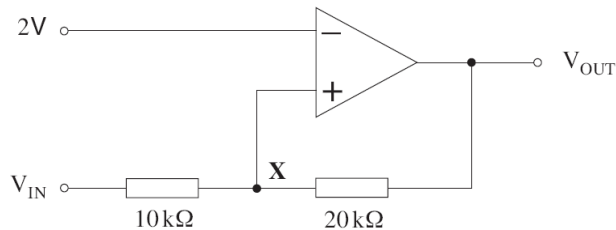


Schmitt Triggers

What's the difference between inverting and Non-inverting?

- Input of an *inverting Schmitt* is connected to the inverting input (-)
- Input of a *non-inverting Schmitt* is connected to the non-inverting input (+)



A Non-Inverting Schmitt Trigger

Calculating the Voltage at X

-For Non-Inverting

The potential between V_{IN} and V_{OUT} is divided between the two resistors.

The biggest resistor gets the biggest share.

In the example, the 20k resistor gets 20/30ths of the voltage

And the other gets 10/30ths or 1/3rd of it.

If V_{IN} is 3V and V_{OUT} is 12V, the potential difference (the difference between the two voltages) across the two resistors is 9V.

The potential difference across the 10k resistor is $10/30 \times 9 = 3V$

The voltage at X is $3V + 3V = 6V$ because it is 3V higher than V_{IN} . Which was already 3V.

Calculating the threshold (point at which it flips)

The output flips when the voltage at one of the inputs becomes larger than the other.

The output flips to negative when the inverting (-) input voltage is highest.

The output flips to positive when the non-inverting (+) input is voltage highest.

Note: In our example, the inverting input voltage is 2V so V_{OUT} will be at 12V when X is above 2V.

Voltage across 20k resistor is 10V.

10K resistor therefore has 5V. (Reason: half the resistance, half the voltage).

If this is the case, V_{IN} is 15V below +12V..

So it flips when V_{IN} is -3V.