

The Boolean Expression for this 4-input NOR gate will therefore be: $Q = A+B+C+D$

If the number of inputs required is an odd number of inputs any “unused” inputs can be held LOW by connecting them directly to ground using suitable “Pull-down” resistors.

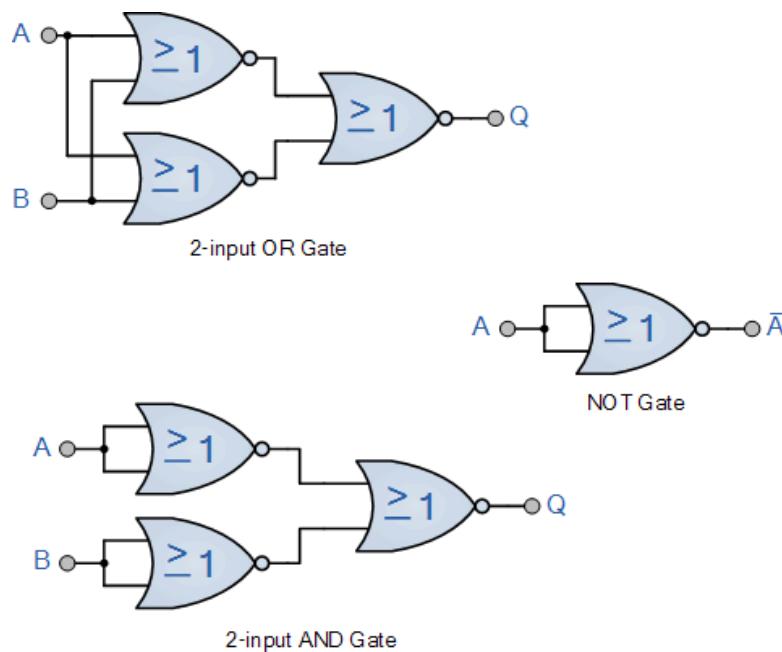
The **Logic NOR Gate** function is sometimes known as the **Pierce Function** and is denoted by a downwards arrow operator as shown, $A \downarrow B$.

The “Universal” NOR Gate

Like the NAND gate seen in the last section, the NOR gate can also be classed as a “Universal” type gate. NOR gates can be used to produce any other type of logic gate function just like the NAND gate and by connecting them together in various combinations the three basic gate types of AND, OR and NOT function can be formed using

only NOR gates, for example.

Various Logic Gates using only NOR Gates



As well as the three common types above, Exclusive-OR, Exclusive- NOR and standard NOR gates can also be formed using just individual NOR gates.

Commonly available digital logic NOR gate IC's include:

TTL Logic NOR Gates

- **74LS02 Quad 2-input**
- **74LS27 Triple 3-input**
- **74LS260 Dual 4-input**

CMOS Logic NOR Gates

- **CD4001 Quad 2-input**
- **CD4025 Triple 3-input**
- **CD4002 Dual 4-input**

7402 Quad 2-input NOR Gate

