

Example 1.1 Binary to Decimal Conversion

Convert 10110_2 to decimal
$$\begin{array}{r} 10110_2 \\ \downarrow \downarrow \downarrow \\ 16 \quad 4 \quad 2 \end{array}$$

$$16 + 4 + 2 = \boxed{22}$$

Convert 10101010_2 to decimal
$$\begin{array}{r} 10101010_2 \\ \downarrow \downarrow \downarrow \downarrow \\ 128 \quad 32 \quad 8 \quad 2 \end{array}$$

$$160 + 10 = \boxed{170}$$

Example 1.5 Convert 333_{10} to hexadecimal and binary

$$\begin{array}{r} -256 \\ 333 \\ \hline 77 \end{array}$$

$$\begin{array}{ccc} 1 & 4 & D \\ \downarrow & \downarrow & \downarrow \\ 256 & 16 & 1 \end{array} \rightarrow \begin{array}{c} 1 \quad 0100 \quad 1101 \\ \text{Hexadecimal} \quad \text{binary} \end{array}$$

$$\begin{array}{r} 256 \times 1 \\ + 16 \times 4 \\ + 1 \times 13 \\ \hline 333 \end{array}$$

Convert $(A B C D)_{16}$ to binary

$$(1010 \ 1011 \ 1100 \ 1101)_2$$

Example 1.7 Binary Addition

$$0111_2 + 0101_2 = \boxed{1100_2}$$

Hexadecimal Subtraction

$$\begin{array}{r} 9 \ 27 \\ A \ B_{16} \\ - 9 \ C_{16} \\ \hline \boxed{0 \ F_{16}} \end{array}$$

Example 1.16 Draw the truth table for 3-input NOR



ABC	Z
000	1
001	0
010	0
011	0
100	0
101	0
110	0
111	0

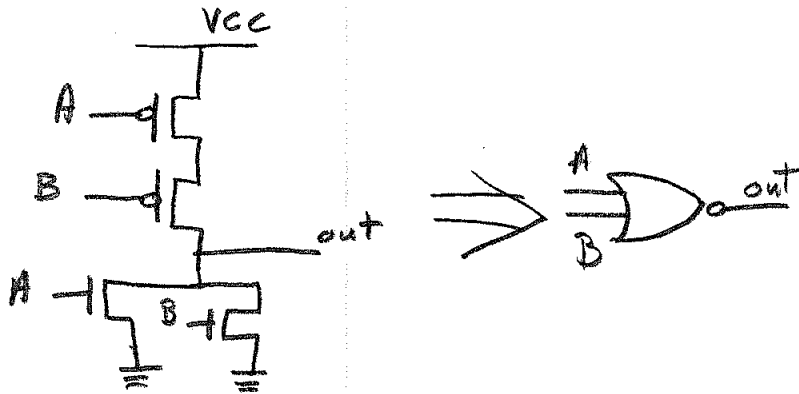
Draw the truth table for 3-input XOR



ABC	Z
000	0
001	1
010	1
011	0
100	1
101	0
110	0
111	1

Example 1.21

Draw a schematic for a two-input NOR gate using CMOS transistors.



Draw a schematic for a 3-input OR gate using CMOS transistors.

