
LESSON 1

Convert the number 100111.1101_2 to the equivalent decimal number.

Select one:

- ☐ 37.9375
- ☒ 39.8125
- ☐ 55.3125
- ☐ 49.6875
- ☐ None of the above.

$$100111.1101_2$$

$$\begin{array}{cccccc} 1 & 0 & 0 & 1 & 1 & 1 \\ 2^5 & 2^4 & 2^3 & 2^2 & 2^1 & 2^0 \end{array}$$

$$\begin{aligned} &= (32 \times 1) + (16 \times 0) + (8 \times 0) + (4 \times 1) + (2 \times 1) + (1 \times 1) \\ &= 32 + 0 + 0 + 4 + 2 + 1 \\ &= 39 \end{aligned}$$

$$\begin{array}{cccc} \cdot & 1 & 1 & 0 & 1 \\ \frac{1}{2^1} & \frac{1}{2^2} & \frac{1}{2^3} & \frac{1}{2^4} & \frac{1}{2^5} \\ \frac{1}{2} & \frac{1}{4} & \frac{1}{8} & \frac{1}{16} & \frac{1}{32} \\ 0.5 & 0.25 & 0.125 & 0.0625 & 0.03125 \end{array}$$

$$\begin{aligned} &= (0.5) + (0.25) + (0.0625) \\ &= 0.8125 \end{aligned}$$

$$= 39.8125_{10}$$

$$\begin{array}{ccccccccc} 32 & 16 & 8 & 4 & 2 & 1 & 0.5 & 0.25 & 0.125 & 0.0625 \\ 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 1 & \end{array}$$

$$\begin{array}{r} 32 \\ 4 \\ 2 \\ +1 \\ \hline 39 \end{array} \quad \begin{array}{r} 0.5 \\ 0.25 \\ +0.0625 \\ \hline 0.8125 \end{array}$$

$$= 39.8125_{10}$$

Convert the number 300.75_{10} to the equivalent binary number.

Select one:

- ☐ 100010001.01
- ☐ 100010001.111
- ☐ 100101100.11
- ☐ 1111101.001
- ☐ None of the above.

300.75_{10}

128 64 32 16 8 4 2 1
1 0 0 1 0 1 1 0 0

$$0.75 \times 2 = 1.50$$

$$0.50 \times 2 = 1.0$$



$= 100101100.11_2$

$$\begin{array}{r} 300 \\ - 256 \\ \hline 44 \\ - 32 \\ \hline 12 \\ - 6 \\ \hline 4 \\ - 4 \\ \hline 0 \end{array}$$

Convert the number 273.25_{10} to the equivalent binary number.

Select one:

- ☒ 100010001 01 100010001.0
- ☐ 100010001.111
- ☐ 100101100.11
- ☐ 1111101.001
- ☐ None of the above.

273.25_{10}

$256 \quad 128 \quad 64 \quad 32 \quad 16 \quad 8 \quad 4 \quad 2 \quad 1$

100010001

$0.25 \times 2 = 0.50$

$0.50 \times 2 = 1.0$

$= 100010001.01_2$

$$\begin{array}{r} 273 \\ -256 \\ \hline 17 \\ -16 \\ \hline 1 \\ -1 \\ \hline 0 \end{array}$$

Convert the number 1061_8 to equivalent decimal numbers.

Select one:

- ☒ 561
- ☐ 692
- ☐ 298
- ☐ 332
- ☐ None of the above.

1061_8

1	0	6	1
8^3	8^2	8^1	8^0
496	64	8	1

$(512) + (48 + 6) + 1$
 $= 512 + 48 + 1$
 $= 561_{10}$

1061_8

1	1	0	1	6	1	1
001	000	110	001			
2^5	2^4	2^3	2^2	2^1	2^0	2^{-1}
$= 1000110001_2$						

512
32
16
4
1
561

$= 561_{10}$

Convert the number 168_{10} to a base 5 number system.

Select one:

- ☐ 2200
- ☐ 4412
- ☒ 1133
- ☐ 2002
- ☐ None of the above

$$168_{10} \rightarrow \text{base } 5$$

$$\begin{array}{r} 5 \overline{) 168} \\ 5 \overline{) 33} - 3 \\ 5 \overline{) 6} - 3 \\ 5 \overline{) 1} - 1 \\ 0 - 1 \end{array} \quad \begin{array}{l} \uparrow \\ \uparrow \\ \uparrow \\ \uparrow \end{array} = 1133_5$$

Convert the number 167_{10} to a base 11 positional number system.

Select one:

☐ 20A

☐ 812

☐ 113

☐ 11B

☒ None of the above.

$167_{10} \rightarrow \text{base } 11$

$$\begin{array}{r} 11 \overline{) 167} \\ \underline{11} \\ 57 \\ \underline{44} \\ 13 \\ \underline{11} \\ 2 \end{array}$$

$$= 142_{11}$$

Convert the number 221122_3 to equivalent decimal numbers.

Select one:

- ☐ 561
- ☒ 692
- ☐ 298
- ☐ 332
- ☐ None of the above.

$$\begin{array}{cccccc} 2 & 2 & 1 & 1 & 2 & 2 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 3^5 & 3^4 & 3^3 & 3^2 & 3^1 & 3^0 \\ 243 & 81 & 27 & 9 & 3 & 1 \end{array} \rightarrow \text{base 10 (decimal)}$$
$$\begin{aligned} &= (2 \times 243) + (2 \times 81) + (1 \times 27) + (1 \times 9) + (2 \times 3) + (2 \times 1) \\ &= 486 + 162 + 27 + 9 + 6 + 2 \\ &= \underline{692}_{10} \end{aligned}$$