

Practical 2

365 to Base₂

	Value	Count	RT	Rem	
		1	32		1000000
2 ⁵	32	1	32	10	1000000
2 ⁴	16	0	32	10	101000
2 ³	8	1	40	2	101000
2 ²	4	0	40	2	101000
2 ¹	2	1	42	0	101010
2 ⁰	1	0	42	0	101010

Q2 45,001₁₀ to Base₂

$$10^4 \ 10^3 \ 10^2 \ 10^1 \ 10^0$$

$$4 \ 5 \ 0 \ 0 \ 1$$

$$(4 \times 10^4) + (5 \times 10^3) + (0 \times 10^2) + (0 \times 10^1) + (1 \times 10^0)$$

$$4000 + 5000$$

Part B $2^{15} 2^{14} 2^{13} 2^{12} 2^{11} 2^{10} 2^9 2^8 2^7 2^6 2^5 2^4 2^3 2^2 2^1 2^0$
 1011001001110101_2 to Base 10

1.

$$32768 + 16384 + 8192 + 4096 + 2048 + 1024 + 512 + 256 + 32 + 16 + 8 + 4 + 2 + 1$$

$$= (1 \times 32768) + (0 \times 16384) + (1 \times 8192) + (1 \times 4096) + (0 \times 2048) + (0 \times 1024) + (1 \times 512) + (0 \times 256) + (0 \times 32) + (1 \times 16) + (1 \times 8) + (1 \times 4) + (0 \times 2) + (1 \times 1)$$

$$= 45597$$

2.

$$2^5 2^4 2^3 2^2 2^1 2^0 2^{-1} 2^{-2} 2^{-3} 2^{-4} 2^{-5} 2^{-6} 2^{-7} 2^{-8} 2^{-9} 2^{-10}$$

$$101110.100111011_2$$

$$32 + 16 + 8 + 4 + 2 + 1 + 0.5 + 0.25 + 0.125 + 0.0625 + 0.03125 + 0.015625 + 7.8125 + 3.90625 + 1.953125 + 9.765625$$

$$= (1 \times 32) + (0 \times 16) + (1 \times 8) + (1 \times 4) + (1 \times 2) + (0 \times 1) + (1 \times 0.5) + (0 \times 0.25) + (0 \times 0.125) + (1 \times 0.0625) + (1 \times 0.03125) + (1 \times 0.015625) + (1 \times 7.8125) + (0 \times 3.90625) + (1 \times 1.953125) + (1 \times 9.765625)$$

$$= 66.14025$$

Prat C

1

$$\begin{array}{r} 1'0'0'1'0'1'1'1' \\ + 0'1'0'1'1'1'1' \\ \hline 1'0'1'0'1'1'0'1'1' \end{array}$$

2.

$$\begin{array}{r} 1'0'0'1'1'0'1'0'1' \\ 0'1'0'1'1'0'1' \\ \hline 1'1'1'1'0'1'0'1' \end{array}$$