Roman Numerals Chart

1	I
2	II
3	III
4	IV
5	V
6	VI
7	VII
8	VIII
9	IX
10	X

11	XI
20	XX
30	XXX
40	XL
50	L
60	LX
70	LXX
80	LXXX
90	XC
100	C

200	CC
300	CCC
400	CD
500	D
600	DC
700	DCC
800	DCCC
900	CM
1000	M
1001	MI

$$\begin{array}{r} {\scriptstyle 1} \\ 234 \\ 47+ \\ \hline 281 \end{array}$$

DECIMAL SYSTEM (10)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

$234 = (2\times100) + (3\times10) + (4\times1) = (2\times10^2) + (3\times10^1) + (4\times10^0)$

100 ← 2 ; 10 ← 3 ; 1 ← 4

Positional notation.

$234 \neq 432$

$15 \neq 4$

$51 \neq 6$

314709 — LEAST SIGNIFICANT DIGIT.

$= 9\times10^0$
$+ 0\times10^1$
$+ 7\times10^2$
$+ 4\times10^3$
$+ 1\times10^4$
$+ 3\times10^5$

base-10 system.

FAISAL

BINARY NUMBERS

Symbols: 0, 1

1101 chocolates

↑ least significant bit

$= 1 \times 2^0$ (1)

$+ 0 \times 2^1$ (0)

$+ 1 \times 2^2$ (4)

$+ 1 \times 2^3$ (8)

$= 13$

Octal: 0, 1, 2, 3, 4, 5, 6, 7

246 ①

$= 6 \times 8^0$ 6

$+ 4 \times 8^1$ 32

$+ 2 \times 8^2$ 128

166

$= 166$

246 (base 8) = 166 (base 10)

Hexadecimal

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F

670AFF → DECIMAL

$= F \times 16^0$ (15×16^0)

$+ F \times 16^1$ (15×16^1)

$+ A \times 16^2$ (10×16^2)

$+ 0 \times 16^3$ (0×16^3)

$+ 7 \times 16^4$ (7×16^4)

$+ 6 \times 16^5$ (6×16^5)

DECIMAL TO BINARY

5_{10}

$$
\begin{array}{r|l}
4 & 5 \\
\hline
 & 4 \\
\hline
 & 1 \\
\end{array}
\qquad
\begin{array}{r|l}
2 & 1 \\
\hline
 & 0 \\
\hline
 & 1 \\
\end{array}
\qquad
\begin{array}{r|l}
1 & 1 \\
\hline
 & 1 \\
\hline
 & 0 \\
\end{array}
$$

$$1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 = 101_2$$

$2^0 = 1$

$2^1 = 2$

$2^2 = 4$

$2^3 = 8$