

# Computer Arithmetic

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## 1 $91_{10} + C6_{16}$

$$\begin{array}{r} 91_{10} = \quad 01011011_2 \\ +C6_{16} = +11000110_2 \\ \hline 100100001_2 = \boxed{289_{10}} \end{array}$$

## 2 $11_8 - 11_{10}$

$$\begin{array}{r} 11_8 = \quad 00001001_2 \\ -11_{10} = +11110101_2 \\ \hline 11111110_2 = \boxed{-2_{10}} \end{array}$$

## 3 $12.3125_{10} + 0110_{I2Q2}$

$$\begin{array}{r} 12.3125_{10} = \quad 1100.0101_{U4Q4} \\ + 0110_{I2Q2} = +0001.1000_{U4Q4} \\ \hline 1101.1101_{U4Q4} = \boxed{13.8125_{10}} \end{array}$$

## 4 $5.750_{10} - 7.125_{10}$

$$\begin{array}{r} 5.750_{10} = \quad 0101.1100_{I4Q4} \\ -7.125_{10} = +1000.1110_{I4Q4} \\ \hline 1110.1010_{I4Q4} = \boxed{-1.375_{10}} \end{array}$$

**5**     $9_{10} * 3_{10}$

$$\begin{array}{r}
 9_{10} = \quad 1001_2 \\
 *3_{10} = \quad *0011_2 \\
 \hline
 \quad 00001001_2 \\
 \quad +00010010_2 \\
 \hline
 \quad 00011011_2 = \boxed{27_{10}}
 \end{array}$$

**6**     $-5_{10} * -6_{16}$

$$\begin{array}{r}
 -5_{10} = \quad 11111011_2 \\
 * -6_{16} = \quad *11111010_2 \\
 \hline
 \quad 11110110_2 \\
 \quad 11011000_2 \\
 \quad 10110000_2 \\
 \quad 01100000_2 \\
 \quad 11000000_2 \\
 \quad +10000000_2 \\
 \hline
 \quad 00011110_2 = \boxed{30_{10}}
 \end{array}$$

**7**     $9.5_{10} * 2.625_{10}$

$$\begin{array}{r}
 9.5_{10} = \quad 1001.1000_{U4Q4} \\
 *2.625_{10} = \quad *0010.1010_{U4Q4} \\
 \hline
 \quad 00000001.00110000_{U8Q8} \\
 \quad 00000100.11000000_{U8Q8} \\
 \quad +00010011.00000000_{U8Q8} \\
 \hline
 \quad 00011000.11110000_{U8Q8} = \boxed{24.9375_{10}}
 \end{array}$$

**8**     $-1.25_{10} * 3.5_{10}$

$$\begin{array}{r}
 -1.25_{10} = \quad 1110.1100_{I4Q4} \\
 *3.5_{10} = \quad *0011.1000_{I4Q4} \\
 \hline
 \quad 11111111.01100000_{I8Q8} \\
 \quad 11111110.11000000_{I8Q8} \\
 \quad +11111101.10000000_{I8Q8} \\
 \hline
 \quad 11111011.10100000_{I8Q8} = \boxed{-4.375_{10}}
 \end{array}$$