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

$8\ 4\ 3\ 2\ 16\ 8\ 4\ 2\ 1$

$= 01011011_2 + 1100\ 0110_2$

$= \begin{array}{r} 01011011 \\ + 11000110 \\ \hline 100100001 \end{array}$

$= 256 + 32 + 1 = 289$

verification $\begin{cases} C6_{16} = 12\cdot16 + 6 = 192+6 = 198 \\ 198 + 91 = 289 \end{cases}$

$\rightarrow \boxed{289}$

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

$= 001001 - 1011$

$= 001001 + 110101$

$= \begin{array}{r} 001001 \\ + 110101 \\ \hline 111110 \end{array}$

verification $\begin{cases} 111110 \rightarrow 111101 \rightarrow 10_2 \\ = -2 \\ 11_8 = 8+1 = 9, \quad 9-11 = -2 \end{cases}$

$\boxed{-2}$

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

$.5\ .25\ .125\ .0625$

$= 1100.0101_{I4Q4} + 0110_{I2Q2}$

$= \begin{array}{r} 1100.0101 \\ + 0001.1000 \\ \hline 1101.1101 \end{array}$

verification $\begin{cases} 12.3125 + 1.5 = 13.8125 \\ 1101.1101 \\ \underbrace{13}\ \underbrace{.5 + .25 + .0625} \\ = .8125 \end{cases}$

$\boxed{13.8125}$

4. $5.75_{10} - 7.125_{10}$

$= 0101.1100_{I4Q4} - 0111.0010$

$= 0101.1100_{I4Q4} + 1000.1110_{I4Q4}$

$=$

$= \begin{array}{r} 0101.1100 \\ + 1000.1110 \\ \hline 1110.1010 \end{array}$

verification $\begin{cases} = 1110.1001 \rightarrow 0001.0110 \\ \quad\quad -(1.375) \\ 5.75 - 7.125 = -(7.125-5.75) \\ \quad\quad\quad = -(1.375) \end{cases}$

$\boxed{1.375}$

5. $9_{10} \cdot 3_{10}$

$= \begin{array}{r} 1001 \\ \times\ 0011 \\ \hline 1001 \\ 1001 \\ \hline 11011 \end{array}$

$1 + 2 + 0 + 8 + 16 = 27$

$\boxed{27}$

6. $(-5)_{10} \cdot (-6)_{16} \quad (\rightarrow -6_{10})$

$= -(101_2) \cdot -(110_2) \quad\quad 16 + ... = 16$

$= (1011_2) \cdot (1010_2) \quad\quad = 11110$

$\begin{array}{r} 1011 \\ \times\ 1010 \\ \hline 1011 \\ 1011 \\ \hline 1101110 \end{array}$ $\left.\begin{array}{c} \\ \\ \\ \end{array}\right\}$ WRONG

$= 0 + 2 + 4 + 8 + 0 + 32 + 64$

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