

# CompArch HW3

$$1. \quad 91_{10} + C6_{16} \quad 91_{10} = 64 + 16 + 8 + 2 + 1 \quad C6_{16} = 192 + 6 = 198 + 91 = 289$$

$$\begin{array}{r} 1011011 \\ + 11000110 \\ \hline 610010001 \end{array}$$

$$256 + 32 + 1$$

$$\boxed{289_{10}}$$

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

$$\begin{array}{r} 11 \\ 6001001 \end{array}$$

$$11_{10} \quad 61011 \text{ unsigned}$$

$$\begin{array}{r} 601011 \text{ signed} \\ 10100 \end{array}$$

$$610101 \text{ signed}$$

$$\begin{array}{r} 001001 \\ 110101 \\ \hline 6111110 \text{ signed} \end{array}$$

$$\begin{array}{r} 000001 \\ 6000010 \text{ unsigned} \end{array} = \boxed{-2_{10}}$$

3.

$$12.3125_{10} + 0110_{12Q2}$$

$$12.3125 = \frac{1}{4} + \frac{1}{16}$$

$$1100.0101$$

$$1100.0101_{14Q4}$$

$$00011000_{14Q4}$$

$$\begin{array}{r} 11000101 \\ + 00011000 \\ \hline 11011101_{14Q4} \end{array}$$

$$8 + 4 + 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{16}$$

$$\boxed{13.8125_{10}}$$

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

$$101.11 \quad 0111.001_{14Q2}$$

$$10111_{13Q2} \quad 1000110$$

$$0101110_{14Q2}$$

$$1000111_{14Q2} \text{ signed}$$

$$5. \quad 9_{10} - 3_{10}$$

$$61001 \quad 60011$$

$$\begin{array}{r} 0011 \\ 1001 \\ \hline 1001 \end{array}$$

$$\begin{array}{r} 611011 \\ 16 + 8 + 2 + 1 \end{array}$$

$$\boxed{27_{10}}$$

$$\begin{array}{r} 0101110 \\ + 1000111 \\ \hline 1110101_{14Q2} \text{ signed} \end{array}$$

$$0001010$$

$$0001011_{14Q2}$$

$$\boxed{-1.325_{10}}$$