CompArch HW3

1. $91_{10} + C6_{16}$
   $= 91_{10} + 198_{10}$
   $= 1011011_{I7Q_0} + 11000110_{I8Q_0}$
   $= 100100000_{I9Q_0}$
   $= \boxed{289_{10}}$

2. $11_8 - 11_{10}$
   $= 1001_{U4Q_0} - 1011_{U4Q_0}$
   $= 1001_{U4Q_0} + 0101_{I4Q_0}$
   $= 1110_{I4Q_0}$
   $= \boxed{-2_{10}}$

3. $12.3125_{10} + 0110_{I_2Q_2}$
   $= 11000101_{U4Q4} + 0110_{I_2Q_2}$
   $= 11011101_{U4Q4}$
   $= \boxed{13.8125_{10}}$

4. $5.75_{10} - 7.125_{10}$
   $= 10111_{U_1Q_2} - 11100_{U_1Q_3}$
   $= 10111_{U_1Q_2} + 00011_{I_3Q_1}$
   $= 11010_{I_3Q_2}$
   $= \boxed{-2.625_{10}}$

5. $9_{10} \cdot 3_{10}$
   $= 1001_{U4Q_0} \cdot 0011_{U4Q_0}$
   $= 11011_{U5Q_0}$
   $= \boxed{27_{10}}$

6. $(-5)_{10} \cdot (-6)_{16}$
   $= 1011_{I4Q_0} \cdot 1010_{I4Q_0}$
   $= 11110_{U5Q_0} = \boxed{30_{10}}$

   $$
   \begin{array}{r}
   1111\,1011 \\
   \times \quad 1111\,1010 \\
   \hline
   1111\,1011 \\
   1111\,1011 \\
   1111\,1011 \\
   \vdots \\
   \hline
   \cdots\cdot 11110
   \end{array}
   $$

7. $9.5_{10} \cdot 2.625_{10}$
   $= 10011_{U4Q_1} \cdot 10101_{U2Q_3}$
   $= 110000111_{U5Q4}$
   $= \boxed{24.9375}$

   $$
   \begin{array}{r}
   10011 \\
   \times \quad 10101 \\
   \hline
   10011 \\
   10011 \\
   10011 \\
   \hline
   110001111
   \end{array}
   $$