

# CompArch Homework

256 128 64 32 16 8 4 2 1 0.5 0.25 0.125 0.0625 0.03125

1)  $9_{10} + 6_{16}$

$9_{10} = 1011011_2$

$6_{16} = 11000110_2$

$$\begin{array}{r} 11000110_2 \\ + 01011011_2 \\ \hline \end{array}$$

$\boxed{100100001_2} = 256_{10} + 32_{10} + 1_{10} = \boxed{289_{10}}$

$6_{16} = 12_{10} = 1100$

$6_{16} = 6_{10} = 0110$

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

$11_8 = 001001_2$

$11_{10} = 1011_2$

$-11_{10} = 0101_2$

$001001$

$+ 000101$

$\boxed{001110_2} = \boxed{-3_{10}}$

3)  $12.3125_{10} + 0110_{12Q2}$

$12.3125_{10} = 1100.0101_{14Q4}$

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

$\boxed{1101.1101_2} = \boxed{13.8125_{10}}$

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

$5.75_{10} = 101.11_{13Q2}$

$7.125_{10} = 111.001_{13Q3}$

$-7.125_{10} = 1000.111_{14Q3}$

$0101.110_{14Q3}$

$+ 1000.111_{14Q3}$

$\boxed{1110.101_{14Q3}} = \boxed{-3.375_{10}}$

$0001.011_{14Q3}$

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

$9_{10} = 1001_2$

$3_{10} = 0011_2$

$$\begin{array}{r} 1001 \\ \times 0011 \\ \hline 1001 \\ 00010 \\ 000000 \\ 0000000 \\ \hline \end{array}$$

$\boxed{001101_2} = \boxed{27_{10}}$

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

$(-5)_{10} = 011_2$

$(-6)_{10} = 010_2$

$$\begin{array}{r} 11111011 \\ \times 11111010 \\ \hline 00000000 \\ 111110110 \\ 0000000000 \\ 11111011000 \\ 111110110000 \\ 1111101100000 \\ 11111011000000 \\ 111110110000000 \\ 1111101100000000 \\ \hline \end{array}$$

$\boxed{00011110_2} = \boxed{30_{10}}$

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7)  $9.5_{10} \cdot 2.625_{10}$

$9.5_{10} = 1001.1_{I4Q1}$

$2.625_{10} = 10.101_{I2Q3}$

$$\begin{array}{r}
 1001.100_{I4Q3} \\
 \times 0010.101_{I4Q3} \\
 \hline
 1001100 \\
 00000000 \\
 100110000 \\
 0000000000 \\
 10011000000 \\
 00000000000 \\
 00000000000 \\
 00000000000 \\
 \hline
 00011000.111100_{I8Q3} = 24.9375_{10}
 \end{array}$$

8)  $(-1.25)_{10} \cdot 3.5_{10}$

$1.25_{10} = 1.01_{I1Q2}$

$(-1.25)_{10} = 10.11_{I2Q2}$

$3.5_{10} = 11.1_{I2Q1}$

$$\begin{array}{r}
 110.11 \\
 \times 011.10 \\
 \hline
 0000000000 \\
 111110110 \\
 111101100 \\
 111011000 \\
 0000000000 \\
 \hline
 (11) 111011.1010_{I6Q4} = -4.375_{10}
 \end{array}$$