

Comp Arch
HW3

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$$1) 9_{10} + C6_{16}$$

$$\begin{array}{r} 0000001_2 \\ 81011011_2 + 10100101_2 \\ \hline 10000000_2 = \boxed{256_{10}} \end{array}$$

$$2) 11_8 - 11_{10} = 001001_2 - 001011_2$$

$$\begin{array}{r} 001001_2 \\ + 110101_2 \\ \hline 111110_2 = \boxed{-2_{10}} \end{array}$$

$$3) 12.3125_{10} + 0110_{5222}$$

$$\begin{array}{r} 1100.0101 \\ + 0001.1000 \\ \hline 1101.1101 = \boxed{13.8125_{10}} \end{array}$$

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

$$\begin{array}{r} 00011010_{1423} \\ + 1000.1111_{1423} \\ \hline 1110.1011_{1423} = -0001.0111_{1423} = \boxed{1.325_{10}} \end{array}$$

$$5) 9_{10} \cdot 3_{10} = 1001_2 \cdot 11_2$$

$$\begin{array}{r} 11_2 \\ 1001_2 \\ \hline 01001_2 \\ + 10010_2 \\ \hline 11011_2 = \boxed{27_{10}} \end{array}$$

$$6) -5_{10} \cdot (-9)_{16} = \overset{\text{sign bit}}{1}101_2 \cdot \overset{\text{sign bit}}{1}1110_2$$

$$\begin{array}{r} 110101_2 \\ 110110_2 \\ \hline 01010_2 \\ 10100_2 \\ \hline 1011110_2 = \boxed{30_{10}} \end{array}$$

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

$$\begin{array}{r} 1001.1111_{1421} \\ \cdot 10.1011_{1223} \\ \hline 0000101010 \\ 000101010 \\ 101010000 \\ \hline 110001111_{1524} = \boxed{24.9375_{10}} \end{array}$$

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

$$\begin{array}{r} 11011111_{1221} \\ \cdot 11011101_{1221} \\ \hline 11111111 \\ 10001111 \\ \hline 10001111_{1525} = \boxed{-4.375_{10}} \end{array}$$

Optional / Challenge:

$$5.5 + .125 + .03125 + .015625$$

$$1011011$$

$$00000010$$

$$+ 01111111$$

$$100000001$$

$$.625 + .65625 = .6875$$

sign exp 23 significant

$$10000001 \quad 611011000$$

$$2 \quad E \quad 4 \quad 8 \quad 6 \quad 8 \quad 0 \quad 1 \quad 1111$$

$$29 + 127 =$$

$$00000000 + 00011011 = 10011010$$

$$01011100 \quad 1001011011010001101111$$

$$\begin{array}{r} \text{exp} = 01011100_2 \\ + 10000001_2 \\ \hline 11011101_2 = 44_{10} \end{array}$$

$$2^{44_{10}} \cdot 1. \boxed{?}_2$$

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