

# Computer Homework 3

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

$$\underbrace{101101_2}_{9_{10}} + \underbrace{11000110_2}_{6_{16}} \Rightarrow$$

$$\begin{array}{r} 101101_2 \\ + 11000110_2 \\ \hline 100100001_2 = 256 + 32 + 1 = 289_{10} \end{array}$$

$$2) 11_8 - 11_{10} = 001001_2 - 01011_2$$

$$\Rightarrow \begin{array}{r} 001001_2 \\ + 10101_2 \\ \hline 001001_2 \\ + 110101_2 \\ \hline 111110_2 \Rightarrow 010_2 = 2 \end{array}$$

$\hookrightarrow 10101_2 = (-11_{10})$

$\boxed{\text{ans: } -2}$

$$3) 12.3125_{10} + 0110_{2222}$$

$$\hookrightarrow 01100.0101_{1424} \Rightarrow \begin{array}{r} 00011000 \\ + 11000101 \\ \hline 11011101_{1424} = 13.875_{10} \end{array}$$

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

$$0101.11_{142} - 0111.001_{142} \Rightarrow \begin{array}{r} 0101110_{142} \\ + 1000111 \\ \hline 1110101 \Rightarrow 0001.011 \\ \hookrightarrow 1.375_{10} \end{array}$$

$\hookrightarrow 1000.110_{142} = 1000.11_{142}$

$\boxed{\text{Ans: } -1.375_{10}}$

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

$$\begin{array}{r} 11 \\ 1001 \\ \hline 0000 \end{array}$$

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

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

$\downarrow$

$$0101 = 1011_2 \quad 1010_2$$

$$\begin{array}{r}
 111011 \\
 \cdot 11010 \\
 \hline
 111110110 \\
 0000000 \\
 \hline
 11011000 \\
 11001110_2 \Rightarrow 110000 \\
 + 00110001 \\
 \hline
 \Rightarrow 00110010_2
 \end{array}$$

ans: 29

$$\begin{array}{r}
 11010_2 \\
 \times 1011 \\
 \hline
 1111010 \\
 111010 \\
 + 1010 \\
 \hline
 0111110 = 30_{10}
 \end{array}$$

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

$\underbrace{\quad\quad\quad}_2 \quad 10.101_2$

$$\begin{array}{r}
 10011001 \\
 \cdot 10011001 \\
 \hline
 1001100100 \\
 1001100100 \\
 + 1001100100 \\
 \hline
 11000111100
 \end{array}$$

$$\begin{array}{r}
 .5 \\
 + .25 \\
 + .125 \\
 + .0625 \\
 \hline
 .9375
 \end{array}$$

$$11000111100_{1566} = 24.9375_{10}$$

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

111101

011.10

$$1.125_{10} = 001.01$$

$$-1.125_{10} = 110.11_2$$

$$\begin{array}{r}
 11011011 \\
 \cdot 01110101 \\
 \hline
 11111011 \\
 1111011 \\
 + 111011 \\
 \hline
 1011101101
 \end{array}$$

-2.375, although it should be -4.375

$$\begin{array}{l}
 \rightarrow 110.0010_2 \\
 010.0011_2
 \end{array}$$

$$= 2.375$$