

(e)

$$\begin{array}{r}
 x+y \quad 1001 \\
 +1111 \\
 \hline
 11000
 \end{array}
 \quad
 \begin{array}{r}
 x-y \quad 1001 \\
 -1111 \\
 \hline
 0110 \rightarrow -0110(x < y)
 \end{array}$$

xyy

$$\begin{array}{r}
 1001 \\
 \times 1111 \\
 \hline
 1001 \\
 1001 \\
 1001 \\
 1001 \\
 \hline
 10001111
 \end{array}$$

x/y

$$\begin{array}{r}
 1001 \\
 -1111 \\
 \hline
 1001 \leftarrow \text{remainder} \\
 0 \leftarrow \text{quotient}
 \end{array}$$

1001 < 1111 q<sub>1</sub>=0; do not subtract

(d)

$$\begin{array}{r}
 x+y \quad 110.11 \\
 +10.11 \\
 \hline
 1001.10
 \end{array}
 \quad
 \begin{array}{r}
 x-y \quad 110.11 \\
 -10.11 \\
 \hline
 100.00
 \end{array}$$

xyy

$$\begin{array}{r}
 110.11 \\
 \times 10.11 \\
 \hline
 11011 \\
 00000 \\
 11011 \\
 \hline
 100101001
 \end{array}$$

x/y

$$\begin{array}{r}
 11011 \\
 -1011 \\
 \hline
 0101 \leftarrow \text{remainder} \\
 10.01 \leftarrow \text{quotient}
 \end{array}$$

1101 > 1011 q<sub>1</sub>=1; subtract

0101 < 1011 q<sub>2</sub>=0; do not subtract

1010 < 1011 q<sub>3</sub>=0; "

10100 > 1011 q<sub>4</sub>=1; subtract

1.5 (e)

$$\begin{array}{r}
 x+y \quad 1110.101 \\
 +1011.100 \\
 \hline
 111010.001
 \end{array}
 \quad
 \begin{array}{r}
 x-y \quad 1110.101 \\
 -1011.100 \\
 \hline
 0011.001
 \end{array}$$

xyy

$$\begin{array}{r}
 1110.101 \\
 \times 1011.100 \\
 \hline
 00000000 \\
 1110101 \\
 1110101 \\
 1110101 \\
 \hline
 10100110001100
 \end{array}$$

x/y

$$\begin{array}{r}
 1110101 \\
 -1011100 \\
 \hline
 0110010 \\
 -1011100 \\
 \hline
 1100100 \\
 -1011100 \\
 \hline
 0010000 \\
 0.010 \leftarrow \text{remainder} \\
 1.010 \leftarrow \text{quotient}
 \end{array}$$

1110101 > 1011100 q<sub>1</sub>=1; subtract

0110010 < 1011100 q<sub>2</sub>=0; do not subtract

1100100 > 1011100 q<sub>3</sub>=1; subtract

0010000 < 1011100 q<sub>4</sub>=0; do not subtract

(f)

$$\begin{array}{r}
 x+y \quad 1011.00 \\
 +1100.00 \\
 \hline
 10111.00
 \end{array}
 \quad
 \begin{array}{r}
 x-y \quad 1100.00 \\
 -1011.00 \\
 \hline
 0001.00 \\
 = -0001.00(X < Y)
 \end{array}$$

xyy

$$\begin{array}{r}
 1011.00 \\
 \times 1100.00 \\
 \hline
 101100000000 \\
 101100 \\
 \hline
 100001000000
 \end{array}$$

x/y

$$\begin{array}{r}
 1011.00 \\
 -1100.00 \\
 \hline
 1011000 \\
 -110000 \\
 \hline
 1010000 \\
 -110000 \\
 \hline
 10000 \\
 10.00 \leftarrow \text{remainder} \\
 0.11 \leftarrow \text{quotient}
 \end{array}$$

101100 < 110000 q<sub>1</sub>=0; do not subtract

1011000 > 110000 q<sub>2</sub>=1; subtract

1010000 > 110000 q<sub>3</sub>=1; "