

Addition Solutions

a) The numbers are already in correct form so...

$$\begin{array}{r} 0.8672 \times 10^0 \\ + 0.6935 \times 10^0 \\ \hline 1.5607 \times 10^0 \end{array} \Rightarrow \text{apply normalization, chopping}$$

$$\boxed{0.1560 \times 10^1}$$

b) $5.63 \Rightarrow 0.5630 \times 10^1$, $0.056879 \Rightarrow 0.0056 \times 10^1$

$$\begin{array}{r} 0.5630 \times 10^1 \\ + 0.0056 \times 10^1 \\ \hline 0.5686 \times 10^1 \end{array} \Rightarrow \text{already normalized,}$$

$$\boxed{0.5686 \times 10^1}$$

c) $510 \Rightarrow 0.5100 \times 10^3$, $0.001693 \Rightarrow 0.0000 \times 10^3$
so you see the effect of adding a small number
to a larger number in a computer. (exaggerated here)

$$\boxed{0.5100 \times 10^3}$$

Subtraction Solution

$$\begin{array}{r} \text{a) } 0.9527 \times 10^0 \\ - 0.3615 \times 10^0 \\ \hline 0.5912 \times 10^0 \end{array} \Rightarrow \text{already normalized,}$$

$$\boxed{0.5912 \times 10^0}$$

$$\text{b) } 78.5 \Rightarrow 0.7850 \times 10^2, \quad 3.6285 \Rightarrow 0.0362 \times 10^2$$

$$\begin{array}{r} 0.7850 \times 10^2 \\ - 0.0362 \times 10^2 \\ \hline 0.7488 \times 10^2 \end{array} \Rightarrow \text{already normalized,}$$

$$\boxed{0.7488 \times 10^2}$$

$$\text{c) } 1.7059 \Rightarrow 0.1705 \times 10^1, \quad 1.7048 \Rightarrow 0.1704 \times 10^1$$

$$\begin{array}{r} 0.1705 \times 10^1 \\ - 0.1704 \times 10^1 \\ \hline 0.0001 \times 10^1 \end{array} = \boxed{0.1000 \times 10^{-2}}$$

Notice loss of sig. dig.

Multiplication Solution

a) $63.2 \Rightarrow 0.6320 \times 10^2$, $3.159 \Rightarrow 0.3159 \times 10^1$

$$\begin{array}{r} 0.6320 \times 10^2 \\ * 0.3159 \times 10^1 \\ \hline 0.1996488 \times 10^3 \end{array} \Rightarrow \text{normalize,}$$

$$\boxed{0.1996 \times 10^3}$$

b) $0.056793 \Rightarrow 0.56793 \times 10^{-1}$, $0.0049735 \Rightarrow 0.4973 \times 10^{-2}$

$$\begin{array}{r} 0.5679 \times 10^{-1} \\ * 0.4973 \times 10^{-2} \\ \hline 0.28241667 \times 10^{-3} \end{array} \Rightarrow \text{normalize,}$$

$$\boxed{0.2824 \times 10^{-3}}$$

c) $9,387.52 \Rightarrow 0.9387 \times 10^4$, $365.27 \Rightarrow 0.3652 \times 10^3$

$$\begin{array}{r} 0.9387 \times 10^4 \\ * 0.3652 \times 10^3 \\ \hline 0.34281324 \times 10^7 \end{array} \Rightarrow \text{normalize,}$$

$$\boxed{0.3428 \times 10^7}$$