

2/25/22 Quiz 4. *Answers*

a)  $\begin{array}{r} +5 \\ -+2 \\ \hline +3 \end{array} \Rightarrow 00010 \Rightarrow +11110$

$\boxed{1}1000x$   
00101

00011, no overflow  
 $00001 \Rightarrow 1111$

$\boxed{1}000x$   
01000

b)  $\begin{array}{r} +9 \\ -1 \\ \hline +7 \end{array} \Rightarrow 01000 \Rightarrow +11111$

$\boxed{1}1111$   
00111

00111, no overflow

c)  $\begin{array}{r} -7 \\ -2 \\ \hline -5 \end{array} \begin{array}{r} +7 \\ +2 \\ \hline +5 \end{array} \begin{array}{r} 00111 \Rightarrow 11001 \\ 00010 \Rightarrow 11110 \end{array} \Rightarrow \begin{array}{r} 100000x \\ 11001 \\ +00010 \end{array}$

11011, no overflow

11011

d)  $\begin{array}{r} -15 \\ +14 \\ \hline -1 \end{array} \begin{array}{r} +15 \\ +14 \\ \hline +14 \end{array} \begin{array}{r} 01111 \Rightarrow 10001 \\ 01110 \end{array} \Rightarrow \begin{array}{r} 100000x \\ 10001 \\ +01110 \end{array}$

$\boxed{1}000x$   
10001  
+01110  
11111

11111, no overflow

e)  $\begin{array}{r} -3 \\ +12 \\ -15 \end{array} \begin{array}{r} +3 \\ +12 \\ -15 \end{array} \begin{array}{r} 00011 \Rightarrow 11101 \\ 01100 \Rightarrow 10100 \end{array} \Rightarrow \begin{array}{r} 1100x \\ 11101 \\ +10100 \end{array}$

$\boxed{1}100x$   
11101  
+10100  
10001

10001, no overflow