

Adding + Subtracting

$$\begin{array}{r} 7 \\ +6 \\ \hline 13 \end{array}$$

$$\begin{array}{r} 00111 \\ +00110 \\ \hline 01101 \end{array}$$

1 ← 1 ← "carries"

$$\begin{array}{r} 7 \\ -6 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 00111 \\ 00110 \\ \hline 00001 \end{array}$$

No "borrows" fortunately

2's complement:

$$6 = 00110 = N$$

$$11001 \quad \text{Step \#1}$$

$$+1 \quad \text{Step \#2}$$

$$-6 = \boxed{11010} = N'$$

"-"

$$\begin{array}{r} 7 \\ +(-6) \\ \hline \end{array}$$

$$\begin{array}{r} 00111 \\ +11010 \\ \hline 100001 \end{array}$$

subtract by adding  
same as above  
↑ ignore the "1"

Complements work in Base 10, also:

$$\begin{array}{r} 7 \\ -6 \\ \hline 1 \end{array}$$

Form complement of  $6 = N$

$$10 - 6 = 4 = N'$$

Look at this!  $N + N' = 0$

$$\begin{array}{r} 7 \\ +4 \\ \hline 11 \end{array}$$

↑ keep  
ignore

$$\begin{array}{r} N \\ + N' \\ \hline 0 \end{array} \rightarrow \begin{array}{r} 6 \\ + 4 \\ \hline 10 \end{array}$$

ignore the "1"

$$\begin{array}{r} 8 \\ -2 \\ \hline 6 \end{array}$$

Form complement of  $N = 2$

$$10 - 2 = 8 = N'$$

$$\begin{array}{r} 8 \\ +8 \\ \hline 16 \end{array}$$

↑ keep  
ignore