

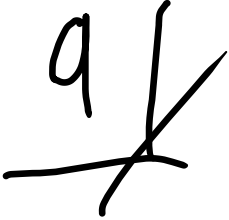


# Chapter 1 Activity

1. Convert the following numbers from base 10 to base 2.

<p>A. 5</p> $\begin{array}{r} 421 \\ \hline 0101 \end{array}$ $\underline{0101} \quad \text{X}$	<p>B. 9</p>
<p>C. 19</p> $\begin{array}{r} 18421 \\ \hline 00011 \end{array}$ $\underline{00011} \quad \text{X}$	<p>D. 22</p>
<p>E. 31</p> $\begin{array}{r} 32168421 \\ \hline 011111 \end{array}$ $\underline{011111} \quad \text{X}$	<p>F. 32</p>
<p>G. 46</p>	<p>H. 67</p>

Convert the following numbers from base 10 to base 16.

2.

A. 5	B. 9 
C. 19	D. 22 
E. 31	F. 32 
G. 46	H. 67



4.

Convert the following numbers from base 2 to base 10.

A. 1010100	B. 1010  8421 101 <hr/> 101
C. 110011	D. 101111  168421 32 471 <hr/> 471
E. 10001	F. 1111 16 151 <hr/> 151
G. 10000111	H. 101101

5.

Convert the following numbers from base 2 to base 16.

A. 10101	B. 10101101 $2^7 + 2^5 + 2^3 + 2^2 + 1 = 173$ $173 / 16 \quad 10 - 13 D$ $16 / 16 \quad 0 - 10 A \quad \underline{AD}$
C. 10011110000	D. 110100110 $0001 \mid 1010 \mid 010$ $1 \quad A \quad 6$ $\underline{1A6}$
E. 100000000	F. 110010 $0011 \mid 10010$ $3 \quad 2$ $\underline{32}$
G. 100110	H. 110111001

6.

Determine the result for the following operations (the numbers are base 2).

<p>A.</p> $\begin{array}{r} 1 \ 1 \ 1 \\ + \quad 1 \ 0 \\ \hline 1 \ 0 \ 0 \ 1 \end{array}$	<p>B.</p> $\begin{array}{r} 1 \ 0 \ 1 \\ + \quad 1 \ 0 \\ \hline \end{array}$
<p>C.</p> $\begin{array}{r} 1 \ 0 \ 1 \ 0 \\ + \quad 1 \ 1 \ 0 \\ \hline 1 \ 0 \ 0 \ 0 \ 0 \end{array}$	<p>D.</p> $\begin{array}{r} 1 \ 0 \ 1 \ 0 \\ + 1 \ 0 \ 1 \ 0 \\ \hline \end{array}$
<p>E.</p> $\begin{array}{r} 1 \ 0 \ 1 \ 0 \\ + 1 \ 1 \ 1 \ 1 \\ \hline 1 \ 1 \ 0 \ 0 \ 1 \end{array}$	<p>F.</p> $\begin{array}{r} 1 \ 0 \ 1 \ 1 \\ + \quad 1 \ 0 \ 1 \\ \hline \end{array}$
<p>G.</p> $\begin{array}{r} 1 \ 1 \ 1 \ 1 \ 0 \\ + \quad 1 \ 1 \ 1 \ 0 \\ \hline \end{array}$	<p>H.</p> $\begin{array}{r} 1 \ 0 \ 1 \ 1 \ 1 \ 0 \\ + \quad \quad \quad 1 \ 0 \ 1 \\ \hline \end{array}$

7. Determine the result for the following operations (the numbers are base 16).

<p>A.</p> $\begin{array}{r} 2 \ F \ D \\ + \quad 1 \ A \\ \hline 3 \ 1 \ 7 \end{array}$	<p>B.</p> $\begin{array}{r} 1 \ 0 \ 1 \\ + \quad 1 \ 0 \\ \hline \end{array}$
<p>C.</p> $\begin{array}{r} A \ B \ C \\ + \quad 1 \ 1 \\ \hline A \ C \ D \end{array}$	<p>D.</p> $\begin{array}{r} A \ B \ C \ D \\ + 1 \ A \ 1 \ B \\ \hline \end{array}$

7.

E.

	9	A	B	C
+	1	2	3	4
<hr style="border-top: 1px dashed black;"/>				
	A C F 0			

F.

	2	2	3	1
+		2	4	9
<hr style="border-top: 1px dashed black;"/>				

0 1 2 3 4 5 6 7 8 9 A B C D E F

8. Determine the result for the following operations (the numbers are base 2).

<p>A.</p> $\begin{array}{r} 1\ 1\ 1 \\ -\quad 1\ 0 \\ \hline \end{array}$	<p>B.</p> $\begin{array}{r} \cancel{1}\ 0\ 1 \\ -\quad 1\ 0 \\ \hline 0\ 1\ 1 \end{array}$
<p>C.</p> $\begin{array}{r} 1\ 0\ 1\ 0 \\ -\quad 1\ 1\ 0 \\ \hline \end{array}$	<p>D.</p> $\begin{array}{r} 1\ 0\ 1\ 0 \\ -\quad 1\ 0\ 1\ 0 \\ \hline 0\ 0\ 0\ 0 \end{array}$
<p>E.</p> $\begin{array}{r} 1\ 1\ 1\ 1 \\ -\quad 1\ 0\ 1\ 0 \\ \hline \end{array}$	<p>F.</p> $\begin{array}{r} \cancel{1}\ 0\ 1\ 1 \\ -\quad 1\ 0\ 1 \\ \hline 0\ 1\ 1\ 0 \end{array}$
<p>G.</p> $\begin{array}{r} 1\ 1\ 1\ 1\ 0 \\ -\quad 1\ 1\ 1\ 0 \\ \hline \end{array}$	<p>H.</p> $\begin{array}{r} 1\ 0\ 1\ 1\ \cancel{1}\ 0 \\ -\quad 1\ 0\ 1 \\ \hline 1\ 0\ 1\ 0\ 0\ 1 \end{array}$

9. Determine the result for the following operations (the numbers are base 2).

<p>A.</p> $\begin{array}{r} 1\ 0\ 1\ 1\ 1\ 0 \\ \text{NOT} \quad \hline 0\ 1\ 0\ 0\ 0\ 1 \end{array}$	<p>B.</p> $\begin{array}{r} 1\ 0\ 1\ 1\ 1\ 0 \\ \text{AND} \quad 1\ 1\ 1\ 0\ 0\ 0 \\ \hline 1\ 0\ 1\ 0\ 0\ 0 \end{array}$
<p>C.</p> $\begin{array}{r} 1\ 0\ 1\ 1\ 1\ 0 \\ \text{OR} \quad 1\ 0\ 0\ 0\ 1\ 1 \\ \hline 1\ 0\ 1\ 1\ 1\ 1 \end{array}$	<p>D.</p> $\begin{array}{r} 1\ 1\ 1\ 0\ 0\ 0 \\ \text{XOR} \quad 1\ 0\ 0\ 0\ 1\ 1 \\ \hline 0\ 1\ 1\ 0\ 1\ 1 \end{array}$



10. Complete the following table.

	Decimal	Signed Positive Binary	One's Complement	Two's Complement
A.	$-5_{10}$	<u>1</u> 101	<u>1</u> 010	<u>1</u> 011
B.	$-17_{10}$	<u>1</u> 10001	<u>1</u> 01110	<u>1</u> 01111
C.	$-42_{10}$	<u>1</u> 101010	<u>1</u> 010101	<u>1</u> 010110

11. Complete the following table.

	Hex	One's complement	Two's complement	Decimal equivalent
A.	$6AF_{16}$	$\begin{array}{r} 011010101111 \\ \hline 100101010000 \end{array}$	$100101010000$	1711
B.	$17_{16}$	$\begin{array}{r} 010111 \\ \hline 101000 \end{array}$	101001	23
C.	$42A6_{16}$	$\begin{array}{r} 010000101010110 \\ \hline 101111010101001 \end{array}$	$101111010101110$	17062