I. Convert the following numbers to binary. Do each calculation using both conversion method.

1. $29_{10} = \underline{11101_2}$

	2 ⁹ 512	$\begin{array}{ c c } 2^8 \\ 256 \end{array}$	2 ⁷ 128	2 ⁶ 64	$\begin{vmatrix} 2^5 \\ 32 \end{vmatrix}$	2 ⁴ 16	$\begin{vmatrix} 2^3 \\ 8 \end{vmatrix}$	$\begin{vmatrix} 2^2 \\ 4 \end{vmatrix}$	$\begin{bmatrix} 2^1 \\ 2 \end{bmatrix}$	$\begin{bmatrix} 2^0 \\ 1 \end{bmatrix}$
Decimal	29	29	29	29	29	29	13	5	1	1
Bits	0	0	0	0	0	1	1	1	0	1

$$29 \div 2 = 14$$

$$14 \div 2 = 7$$

$$7 \div 2 = 3$$

$$1 \div 2 = 0$$

2. $79_{10} = \underline{1001111_2}$

2 ⁹	2 ⁸	27	$\frac{2^6}{64}$	2^{5}	24	$\frac{2^3}{8}$	$\frac{2^2}{4}$	$\frac{2^1}{2}$	2^{0}
312	230	120	04	32	10	0	4		1
79	79	79	79	15	15	15	7	3	1
0	0	0	1	0	0	1	1	1	1
	512 79	512 256 79 79	512 256 128 79 79 79	512 256 128 64 79 79 79 79	512 256 128 64 32 79 79 79 79 15	512 256 128 64 32 16 79 79 79 79 15 15	512 256 128 64 32 16 8 79 79 79 79 15 15 15	512 256 128 64 32 16 8 4 79 79 79 79 15 15 15 7	512 256 128 64 32 16 8 4 2 79 79 79 79 15 15 15 7 3

$$79 \div 2 = 39$$

$$39 \div 2 = 19$$

$$19 \div 2 = 9$$

$$9 \div 2 = 4$$

$$4 \div 2 = 2$$

$$2 \div 2 = 1$$

$$1 \div 2 = 0$$

3. $273_{10} = 100010001_2$

	2 ⁹ 512	2 ⁸ 256	2 ⁷ 128	2 ⁶ 64	2 ⁵ 32	2 ⁴ 16	2 ³ 8	2^2 4	2 ¹ 2	2 ⁰
Decimal	273	273	17	17	17	17	1	1	1	1
Bits	0	1	0	0	0	1	0	0	0	1

$$273 \div 2 = 136$$
 r. 1

$$136 \div 2 = 68$$

$$68 \div 2 = 34$$
 r. 0

$$34 \div 2 = 17$$

$$17 \div 2 = 8$$
 r. 1

$$8 \div 2 = 4$$
 r. 0

$$4 \div 2 = 2$$

$$2 \div 2 = 1$$

$$1 \div 2 = 0$$

4.
$$127_{10} = \underline{111111_2}$$

	2 ⁹ 512	2 ⁸ 256	2 ⁷ 128	2 ⁶ 64	$\begin{vmatrix} 2^5 \\ 32 \end{vmatrix}$	2 ⁴ 16	$\begin{vmatrix} 2^3 \\ 8 \end{vmatrix}$	$\begin{vmatrix} 2^2 \\ 4 \end{vmatrix}$	$\begin{bmatrix} 2^1 \\ 2 \end{bmatrix}$	$\begin{vmatrix} 2^0 \\ 1 \end{vmatrix}$	
Decimal	273	273	17	17	17	17	1	1	1	1	
Bits	0	0	0	1	1	1	1	1	1	1	

$$127 \div 2 = 63$$
 r. 1

$$63 \div 2 = 31$$

$$31 \div 2 = 15$$
 r. 1

$$15 \div 2 = 7$$
 r. 1

$$7 \div 2 = 3$$
 r. 1

$$3 \div 2 = 1$$

$$1 \div 2 = 0$$

5. $742_{10} = 1011100110_2$

	2 ⁹ 512	2 ⁸ 256	2 ⁷ 128	2 ⁶ 64	2 ⁵ 32	2 ⁴ 16	$\begin{bmatrix} 2^3 \\ 8 \end{bmatrix}$	$\begin{vmatrix} 2^2 \\ 4 \end{vmatrix}$	$\begin{bmatrix} 2^1 \\ 2 \end{bmatrix}$	$\begin{vmatrix} 2^0 \\ 1 \end{vmatrix}$	
Decimal	742	230	230	102	38	6	6	6	2	0	
Bits	1	0	1	1	1	0	0	1	1	0	

$$742 \div 2 = 371$$

$$371 \div 2 = 185$$

$$185 \div 2 = 92$$

$$92 \div 2 = 46$$

$$46 \div 2 = 23$$

$$23 \div 2 = 11$$

$$11 \div 2 = 5$$

$$5 \div 2 = 2$$

$$2 \div 2 = 1$$

$$1 \div 2 = 0$$

II. Convert the following numbers to Octal. Write your solution for each item

6. $742_{10} = \underline{201_8}$

$$129 \div 8 = 16$$

$$16 \div 8 = 2$$

$$2 \div 8 = 0$$

7. $1248_{10} = \underline{2340_8}$

$$1248 \div 8 = 156$$

$$156 \div 8 = 19$$

$$19 \div 8 = 2$$

$$2 \div 8 = 0$$

8. $79_{10} = \underline{117_8}$

$$79 \div 8 = 9$$

$$9 \div 8 = 1$$

$$1 \div 8 = 0$$

Convert the following numbers to hexadecimal. Write your solution for each item

9. $175_{10} = AF_{16}$

$$175 \div 16 = 10$$
 r. $15 = F$

r.
$$15 = F$$

$$10 \div 16 = 0$$
 r. 10

10 7134₁₀ = $\underline{1BDE_{16}}$

$$7134 \div 16 = 445$$
 r. $14 = E$

r.
$$14 = E$$

$$445 \div 16 = 27$$

r.
$$13 = D$$

$$27 \div 16 = 1$$

r.
$$11 = B$$

$$1 \div 16 = 0$$
 r. 1

11 $9653_{10} = 25B5_{16}$

$$9653 \div 16 = 603$$

$$603 \div 16 = 37$$

r.
$$11 = B$$

$$37 \div 16 = 2$$

$$2 \div 16 = 0$$
 r. 2

12 $1052_{10} = 41C_{16}$

$$1052 \div 16 = 65$$
 r. $12 = C$

r.
$$12 = C$$

$$65 \div 16 = 4$$

$$4 \div 16 = 0$$