

1.4

12-bit binary : 1111 1111 1111

Decimal : $2^{12} - 1 = (4095)_{10}$

Hexadecimal : $(FFF)_{16}$

1.8

(a) Converting $(512)_{10}$ to binary is by repeated division by 2.

$$\begin{array}{r|rr}
 2 & 512 & \\
 2 & 256 & - 0 \\
 2 & 128 & - 0 \\
 2 & 64 & - 0 \\
 2 & 32 & - 0 \\
 2 & 16 & - 0 \\
 2 & 8 & - 0 \\
 2 & 4 & - 0 \\
 2 & 2 & - 0 \\
 & 1 & - 0
 \end{array}
 \Rightarrow (1000000000)_2$$

(b) $(512)_{10}$ to hexadecimal is repeated division by 16.

$$\begin{array}{r|rr}
 16 & 512 & \\
 16 & 32 & - 0
 \end{array}
 \Rightarrow (200)_{16}$$

2 - 0 $\Downarrow$ replace each digit by binary

To binary

$$(200)_{16} = (10\ 0000\ 0000)_2$$

2nd method is faster.

1.18

(a)

	10010		10101	
1's comp	: 01101		<u>+01110</u>	
2's comp	: 01110		00011	Ans: 00011

drop ← 1

(b)

	100110		010010	
1's comp	: 011001		<u>+011010</u>	
2's comp	: 011010		101100	$\Rightarrow -010100$

(c)

	110101		010011	
1's comp	: 001010		<u>+001011</u>	
2's comp	: 001011		011110	$\Rightarrow -100010$

(d)

	101101		101000	
1's comp	: 010010		<u>+010011</u>	

1.22

$(7654)_{10}$

BCD: 0111 0110 0101 0100

ASCII: 0 0110111 0110110 0110101 0110100

7
6
5
4

1.36

