Converting Bases:

(a) convert 93_{10} to binary:

observe the modulus + subtraction method

$93 \% 2 = 1$	so we do	$(93-1)/2$	and place the bit	1 (least sig.)
$46 \% 2 = 0$	so	$46/2 = 23$	and	0
$23 \% 2 = 1$		$(23-1)/2 = 11$		1
		$(11-1)/2 = 5$		1
		$(5-1)/2 = 2$		1
		$2/2 = 1$		0
$1 \% 2 = 1$		$(1-1)/2 = 0$		1 (most significant)

this gives us 1011101_2

(b) convert 215_{10} to hex:

First convert to binary:

$(215-1)/2 = 107$		1
$(107-1)/2 = 53$		1
$(53-1)/2 = 26$		1
$26/2 = 13$		0
$(13-1)/2 = 6$		1
$6/2 = 3$		0
$(3-1)/2 = 1$		1
$(1-1)/2 = 0$		1

gives 11010111

13_{10} → D_{16}

7_{10} → 7_{16}

$D7_{16}$

(c) 11000101 to decimal

1	1	0	0	0	1	0	1
128	64	32	16	8	4	2	1

$128 + 64 + 4 + 1 = 197$

(d) 10110110 to hex

add a 0 here to get length correct → 01011010

5_{10} 10_{10}

$5_{10} \rightarrow 5_{16}$ $\quad 10_{10} \rightarrow A_{16}$

gives us $5A_{16}$

(e) $C14B_{16}$ to decimal

C	1	4	B
↓	↓	↓	↓
12	1	4	11
↓	↓	↓	↓
1100	0001	0100	1011

2^{11}
2^{6} 64
2^{8} 256
16384
+ 32768
49483

(f) 5A6D to binary

5	A	6	D
0101	1010	0110	1101

2) integer representation

(a) Unsigned 43-bit Max: $2^{44}-1$ Min: 0

(b) Signed 43-bit Max: $2^{43}-1$ Min: $(-1)2^{43}$

(c) Unsigned 11-bit Max: $2^{12}-1$ Min: 0

(d) Signed 11-bit Max: $2^{11}-1$ Min: $(-1)2^{11}$