

## Converting Bases:

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

observe the modulus + subtraction method

$93 \div 2 = 1$  so we do  $(93-1)/2$  and place the bit 1 (least sig.)

$46 \div 2 = 0$  so  $46/2 = 23$  and 0

$23 \div 2 = 1$   $(23-1)/2 = 11$  1

$(11-1)/2 = 5$  1

$(5-1)/2 = 2$  1

$2/2 = 1$  0

$1 \div 2 = 1$   $(1-1)/2 = 0$  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

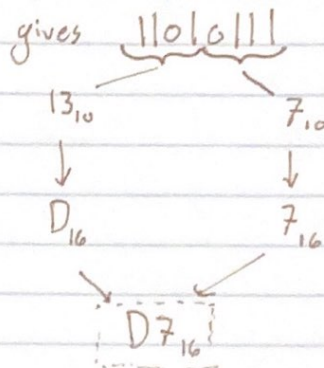
$26/2 = 13$  0

$(13-1)/2 = 6$  1

$6/2 = 3$  0

$(3-1)/2 = 1$  1

$(1-1)/2 = 0$  1



(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)  $1011010$  to hex

add 0 here to get length correct

$01011010$   
 $5_{10}$        $10_{10}$

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

gives us  $5A_{16}$

⑤  $C14B_{16}$  to decimal

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

	11
2	64
	256
16	384
+	32768
	49483

⑥  $5A6D$  to binary

5	A	6	D
0101	1010	0110	1101

2) integer representation

① Unsigned 43-bit

Max:  $2^{43}-1$

Min: 0

② Signed 43-bit

Max:  $2^{42}-1$

Min:  $(-1)2^{42}$

③ Unsigned 11-bit

Max:  $2^{11}-1$

Min: 0

④ Signed 11-bit

Max:  $2^{10}-1$

Min:  $(-1)2^{10}$