Number Bases

Decimal	Binary	Hex
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

IEC Prefixes

Name	Abbr	Factor
Kibi	Ki	$2^{10} = 1{,}024$
mebi	Mi	$2^{20} = 1{,}048{,}576$
gibi	Gi	$2^{30} = 1{,}073{,}741{,}824$
tebi	Ti	$2^{40} = 1{,}099{,}511{,}627{,}776$
pebi	Pi	$2^{50} = 1{,}125{,}899{,}906{,}842{,}624$
exbi	Ei	$2^{60} = 1{,}152{,}921{,}504{,}606{,}846{,}976$
Zebi	Zi	$2^{70} = 1{,}180{,}591{,}620{,}717{,}411{,}303{,}424$
yobi	Yi	$2^{80} = 1{,}208{,}925{,}819{,}614{,}629{,}174{,}706{,}176$

Exercises

1) Fill in the following table:

Decimal	Binary	Hex
31		
	0b0001 1011	
		0x11
		0x7f
	0b1100 1010	
255		

2) The Koozbanian language has 768 distinct symbols. What is the minimum number of bits needed to represent every symbol?

3) Represent the following values in IEC format:

2^{18} 2^{3} 2^{43} 2^{20}

4) Your awesome new computer has 1.5 TiB of byte-addressed memory (1.5Ti possible addresses). How many bits are needed to represent every address?