

## Hexadecimal Long Division

Here's an long division hex example that I promised. I use a Suanpan and my [hexadecimal tables](#).

This is the problem,

**A193/A7=? (It's in decimal 41363/167)**

abcdefghij  
0A193000A7

abcdefghij  
10193000A7 : initial settings. Rod c=unit rod

abcdefghij  
0FB93000A7 : A/A=F1. We should subtract  $1*7=7$  from rod c but we cannot do it...

abcdefghij  
0F503000A7 : change the number A on rod b to number F and add number A (first digit of divisor) on rod c.

abcdefghij  
0F803000A7 : now we can subtract  $F*7=69$  from rods c-d

abcdefghij  
0F7A3000A7 :  $5/A=8$ . Again cannot subtract  $8*7=38$  from rods d-e.

abcdefghij  
0F772000A7 : have to reduce one from rod c and add number A on rod d.

Now we can subtract  $7*7=31$  from rods d-e.

Answer is F7+r72 (In decimal 247+r114)

To me this is a very powerful way to divide in hex.

## Convert Hexadecimal to Decimal by Repeatedly Dividing by Hex A

Convert hex to decimal using Suanpan and [hexadecimal tables](#).

Example: Convert hex 7A03 to decimal dividing it repeatedly by hex number A.

abcdefghi  
07A03000A : Set dividend and divisor. Rod d= unit rod.

abcdefghi  
0BC03000A :  $7/A=B+2$

abcdefghi  
0C203000A :  $C/A=F1+2$

abcdefghi  
0C3230000A : 2/A=3+2

abcdefghi  
0C3350000A : 2/A=3+2

Now, we have divided hex number 7A03 by number A. Integer part of the answer is C33 and the remainder is 5. Continuing dividing integer part (C33), by A. Rod c = unit rod.

abcdefghi  
123350000A : C/A= F1+2.

abcdefghi  
135350000A : 2/A=3+2

abcdefghi  
138350000A : 5/A=8

The Integer part of the answer is now 138 and remainder is 3. Again continuing to divide 138 by A. Rod b= unit rod.

abcdefghi  
198350000A : 1/A=1+6

abcdefghi  
1EC350000A : 9/A=E+4

abcdefghi  
1F2350000A : C/A=F1+2

The Integer part of the answer is now 1F and remainder is 2. Continuing to divide 1F by A. Rod a= unit rod.

abcdefghi  
1F2350000A : 1/A=1+6.

Cannot add number 6 directly on rod b so, let's divide first number F on rod b by A.

abcdefghi  
252350000A : F/A=F1+5

abcdefghi  
2B2350000A : Now we can add number 6 on rod b

abcdefghi  
312350000A : B/A=F1+1

Finally we get the answer. Hex number 7A03 converted to a decimal is 31235

Finally, a link to a fun video,

Long Division in Hexadecimal Demonstration: <http://youtu.be/cpxQ4UVEPrA>

Hannu