2-4-2016

CONVERTING FROM BASE-n TO BASE-10

CONVERT THE BASE-5 NUMBER 23.31_5 TO BASE-10

125	25	5	1	.	1/5	1/25	
		2	3	.	3	1	
		$2*5$	$+3*1$		$+3*\frac{1}{5}$	$+1*\frac{1}{25}$	$=13.64$

POSSIBLE DIGITS: 0, 1, 2, 3, 4

$23.31_5 = 13.64_{10}$

(BINARY)

CONVERT THE BASE-2 NUMBER 11010.11 TO BASE 10

POSSIBLE DIGITS: 0, 1

16	8	4	2	1	.	1/2	1/4	1/8
1	1	0	1	0	.	1	1	0
$1*16$	$+1*8$	$+0*4$	$+1*2$	$+0*1$		$+1*\frac{1}{2}$	$+1*\frac{1}{4}$	$+0*\frac{1}{8}$

$11010.11_2 = 26.75_{10}$

BINARY: 8 BITS = 1 BYTE — 10110101 — ~~OCTAL~~ HEXADECIMAL

4 BITS = $\frac{1}{2}$ BYTE — 0101 — ~~OR BASE 4~~ OCTAL

NIBBLE

HEXADECIMAL BASE-16

POSSIBLE DIGITS: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F

COLORS:
- RED F0
- GREEN 9B
- BLUE 23

CONVERTING FROM BASE-10 TO BASE-n

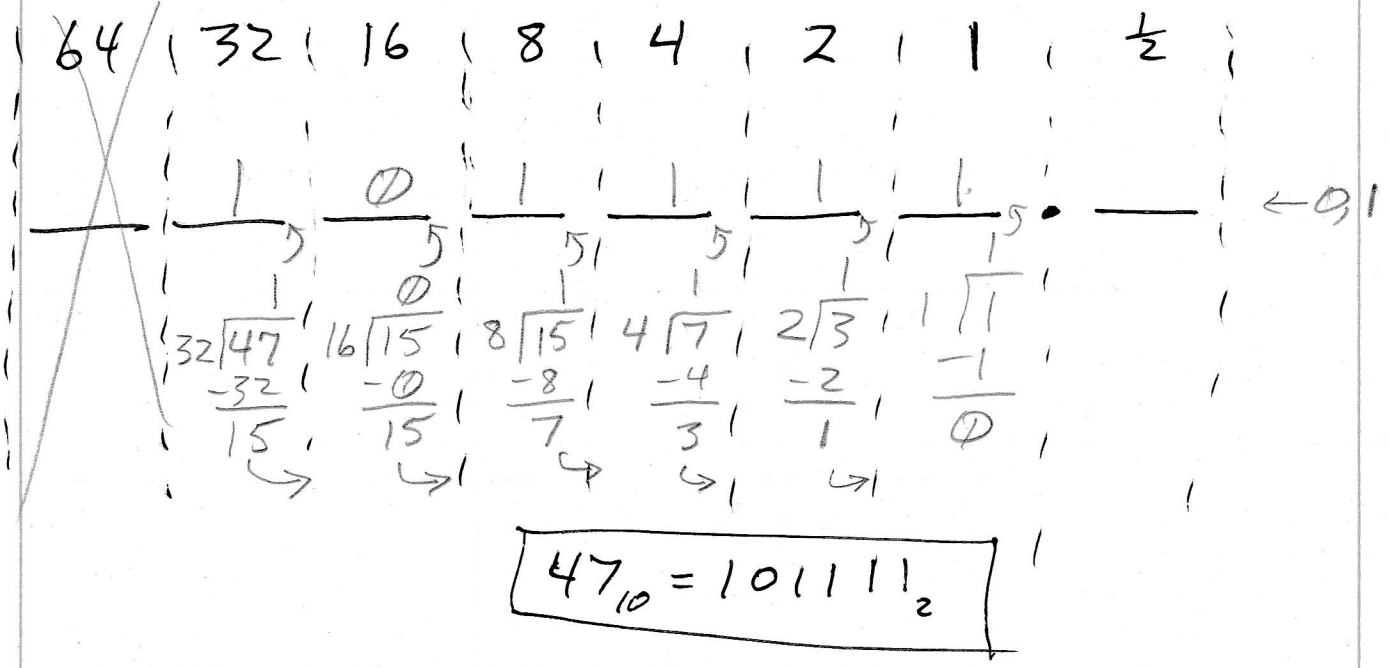
CONVERT THE BASE-10 NUMBER 154_{10} TO BASE-4 (DIGITS: 0, 1, 2, 3)

256	64	16	4	1	.	$\frac{1}{4}$	$\frac{1}{16}$
	2	1	2	2	.		
	$64\overline{)154}$ = 2, -128, 26	$16\overline{)26}$ = 1, -16, 10	$4\overline{)10}$ = 2, -8, 2	$1\overline{)2}$ = 2, -2, 0			

$154_{10} = 2122_4$

- START IN THE LEFT-MOST COLUMN THAT IS LESS THAN YOUR NUMBER TO CONVERT
- DIVIDE COLUMN VALUE IN NUMBER

CONVERT THE NUMBER 47 TO BASE-2



$47_{10} = 101111_2$

COUNTING IN ANOTHER BASE

BASE-10

0 1 2 3 4 5 6 7 8 9 10 11 12 13 ⋮ 19 20 21 22 ⋮ 98 99 100 101 ⋮

BASE-5 (0,1,2,3,4)

0 1 2 3 4 10 11 12 13 14 20 21 22 23 ⋮ 43 44 100 101 ⋮

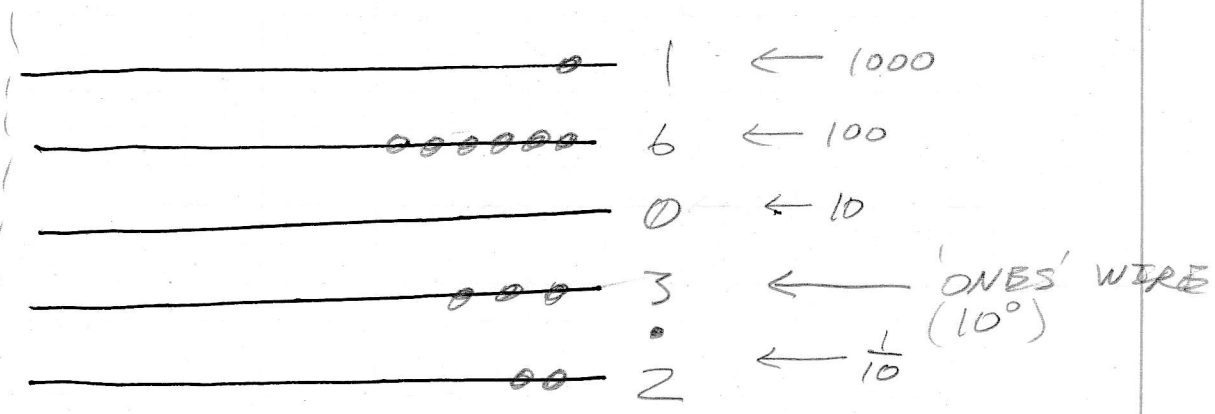
BASE-3 (0,1,2)

0 1 2 10 11 12 20 21 22 100 101 102 110 111 112

BASE-2 (0,1)

0 1 10 11 100 101 110 111 1000 1001 1010 1011 1100 1101 ⋮

READING AN ABACUS



1603.2