

## Practice with Number Bases - ANSWERS

1)

Base 10	Base 3
0	0
1	1
2	2
3	10
4	11
5	12
6	20
7	21
8	22
9	100
10	101
11	102
12	110
13	111
14	112
15	120
16	121
17	122
18	200
19	201
20	202
21	210
22	211
23	212
24	220
25	221
26	222
27	1000
28	1001
29	1002
30	1010

b) Multiplication

Base 3 x	0	1	2	10
0	0	0	0	0
1	0	1	2	10
2	0	2	11	20
10	0	10	20	100

3)

a)

$$\begin{array}{r} 2 \ 1 \\ 2 \ 2 \\ \hline 1 \ 2 \ 0 \\ \hline 1 \ 1 \end{array}$$

b)

$$\begin{array}{r} 12 \ 20 \ 11 \\ 1 \ 2 \\ \hline 1 \ 1 \ 2 \end{array}$$

c)

$$\begin{array}{r} 2 \ 1 \\ 1 \ 0 \ 2 \\ \hline 1 \ 1 \ 2 \\ 2 \ 1 \ 0 \ 0 \\ \hline 2 \ 2 \ 1 \ 2 \end{array}$$

2)

a) Addition

Base 3 +	0	1	2	10
0	0	1	2	10
1	1	2	10	11
2	2	10	11	12
10	10	11	12	20

d) You need to work out the  $21_3$  times table which goes:

$$\begin{array}{ll} 1_3 & 21_3 \\ 2_3 & 112_3 \\ 10_3 & 210_3 \\ 11_3 & 1001_3 \end{array}$$

and there's the answer: it goes  $11_3$  times

(This is the same as  $28 \div 7 = 4$  in base 10)