Mathematics

Operations in different bases

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Try this

True or False?

$223_4 \approx 300_4$

$34_5 \approx 40_5$

$3211_4 \approx 10000_4$

$223_5 \approx 300_5$

Which base is easiest to round in?

Try this

Subtraction in base 7

10 – 1 = 6
10 – 3 = 4
100 – 20 = 50

Why?

243s	49s	7s	1s

100 – 1

1000 – 1

100 – 11

1000 – 11

What connections/patterns do you see?

Try this

100 – 1

1000 – 1

100 – 11

1000 – 11

Try this

Number bonds in Base 3, 4, and 5.

Base 3

+	1	2
1	2	10
2	10	11

Base 4

+	1	2	3
1			
2			
3			

Base 5

+	1	2	3	4
1				
2				
3				
4				

Draw a number bonds table for base 7.

Try this

Use the example of this addition in base 4 to work out the answers to these addition in base 4.

$$\begin{array}{r} 323 \\ +\ 232 \\ \hline 1221 \\ \hline {}_{1\ 1\ } \end{array}$$

23 + 31

33 + 21

1230 + 3210

203 + 1331

323 + 333

31 + 203 + 33

Check you answers by converting back to base 10.
Try the same calculations in base **8**. What are the similarities?

Try this

The digits of base 12 are:

0 1 2 3 4 5 6 7 8 9 A B

Task 1: True or False?

7 + 7 = 12	A + B = 19	1A – B = B

Task 2: Working in base 12, calculate:

536 + ABA	100 – A7	6BA + 5AB
BBB + A87	ABBA + BAAB	BAB – ABA

In imperial measures, there are 12 inches in a foot.
Before decimal money, there were 12 pennies in a shilling.
Why do you think base 12 was commonly used?