"crazy numbers"...

8+7=3 12+1=1

10+8=6 5+11=4

The result is less than the addends!?!?

Can other operations also be done?

3 – 6 = 9 5 – 3 = 2 2 – 4 = 10

6 x 8 = 12 2 x 4 = 8 7 x 5 = 11

I didn't make fun of you… You reflect on what I have told you

*In N 8 + 7= 15,but I wrote **3**; and so 10 + 8 do 18,*
*but I put **6**…*

In which environment did I make these calculations?

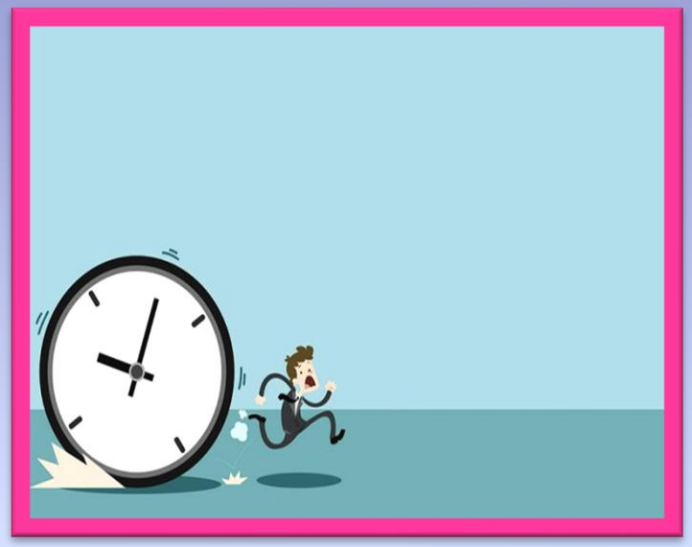
In N …

8+ 7= 15 ⟶ *3*

10+ 8 = 18 ⟶ *6*

12+1 = 13 ⟶ *1*

5+11= 16 ⟶ *4*



this is the last help:
The time is flowing…

Modular arithmetic

CLOCK

Modular arithmetic

CLOCK

Now we make the table

+	0	1	2	3	4	5	6	7	8	9	10	11
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												

The table of addition

A= {0;1;2;3;4;5;6;7;8;9;10;11}

Is the addition close?

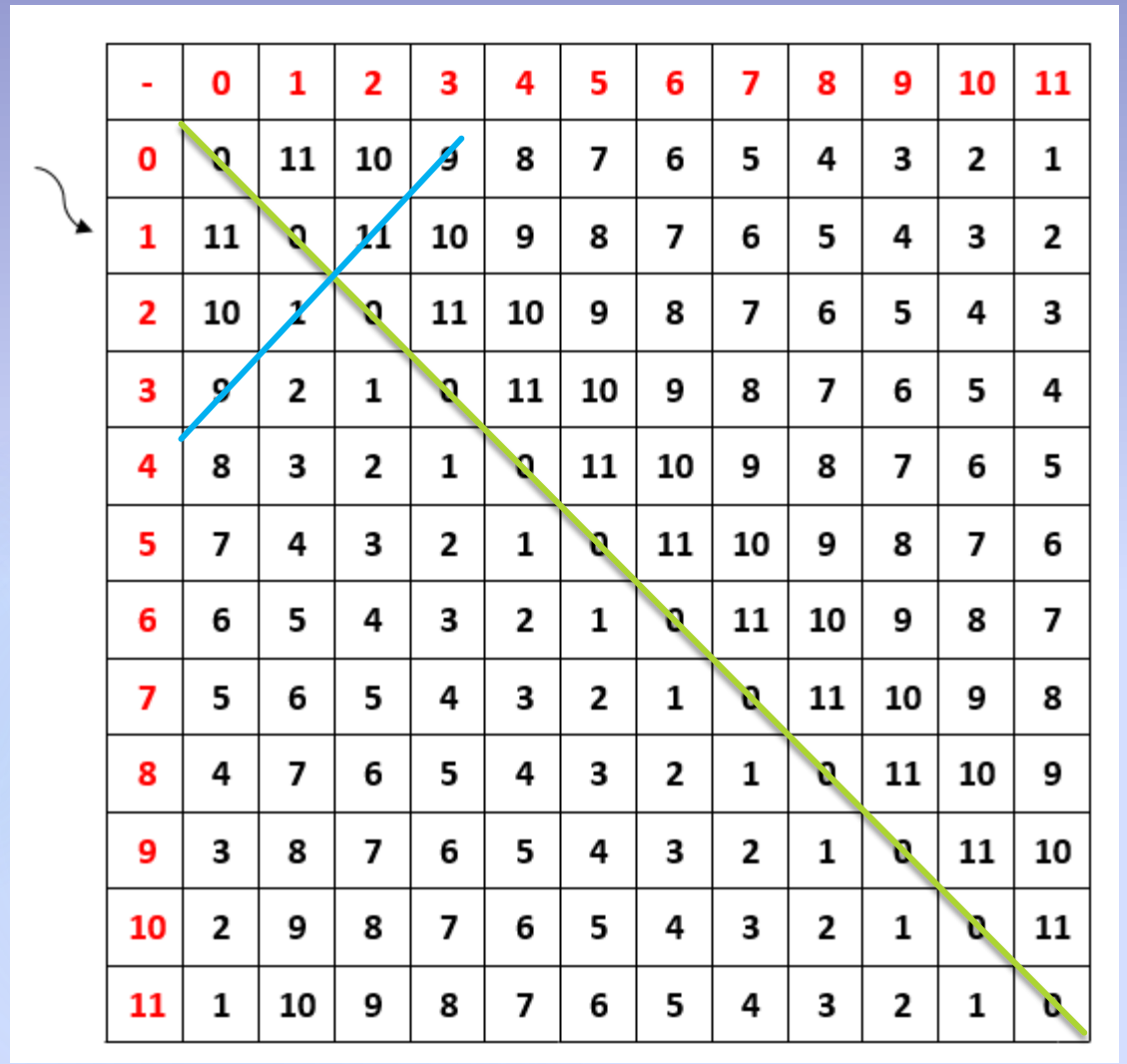
Is there a neutral element?

Is there the commutative property?

are the numbers on a straight line? Is there a order?

The table of subtraction

A = {0;1;2;3;4;5;6;7;8;9;10;11}



-	0	1	2	3	4	5	6	7	8	9	10	11
0	0	11	10	9	8	7	6	5	4	3	2	1
1	11	0	11	10	9	8	7	6	5	4	3	2
2	10	1	0	11	10	9	8	7	6	5	4	3
3	9	2	1	0	11	10	9	8	7	6	5	4
4	8	3	2	1	0	11	10	9	8	7	6	5
5	7	4	3	2	1	0	11	10	9	8	7	6
6	6	5	4	3	2	1	0	11	10	9	8	7
7	5	6	5	4	3	2	1	0	11	10	9	8
8	4	7	6	5	4	3	2	1	0	11	10	9
9	3	8	7	6	5	4	3	2	1	0	11	10
10	2	9	8	7	6	5	4	3	2	1	0	11
11	1	10	9	8	7	6	5	4	3	2	1	0

Is the subtraction close?

Is there a neutral element?

Is there the commutative property?

Now we do some examples…

The pointer of hours marks 12; what will time mark then 29 hours?
We have to do a division:
29 : 12 = 2 with the rest of 5.
After 29 hours the pointer will do 2 complete turns and it will be on 5, it's marking 5 o'clock.
In modular arithmetic the operation becomes: 0 ≈ 29 = 5

At 3: what will time mark then 25 hours?

3 + 25 = 28 28 : 12 = 2 with the rest of 4

The pointer will mark 4 o’clock.

Thanks for your attention