

Ewen Hensman.



= pattern



= pattern



= pattern

1	4	+	5	+	6	-	7	=	8	✓	+	+	-
2	4	-	5	-	6	-	7	=	-14	✓	-	-	-
3	4	+	5	+	6	+	7	=	22	✓	+	+	+
4	4	+	5	-	6	+	7	=	10	✓	+	+	+
5	4	-	5	-	6	+	7	=	0	✓	-	-	+
6	4	-	5	+	6	-	7	=	-2	✓	-	+	-
7	4	-	5	+	6	+	7	=	12	✓	-	+	+
8	4	+	5	-	6	-	7	=	-4	✓	+	-	-

1	9	+	10	+	11	+	12	=	42	+	+	+
2	9	-	10	-	11	-	12	=	-24	-	-	-
3	9	+	10	-	11	+	12	=	20	+	-	+
4	9	-	10	+	11	-	12	=	-2	-	+	-
5	9	+	10	+	11	-	12	=	18	+	+	-
6	9	-	10	-	11	+	12	=	0	-	-	+
7	9	-	10	+	11	+	12	=	22	-	+	+
8	9	+	10	-	11	-	12	=	-4	+	-	-

Tests: 21 - 22 - 23 + 24 = 0
 100 - 101 - 102 + 103 = 0
 42 + 43 - 44 - 45 = -4
 63 - 64 + 65 - 66 = -2

What would happen if I changed the amount of consecutive numbers.

Numbers we're gonna use: 12, 13, 14, 15, 16, 17, 18, 19, 20

1.	12	+	13	+	14	+	15	+	16	+	17	+	18	+	19	+	20	=	144
2	12	-	13	-	14	-	15	-	16	-	17	-	18	-	19	-	20	=	-120
3.	12	+	13	+	14	+	15	+	16	+	17	+	18	+	19	-	20	=	104
4.	12	+	13	+	14	+	15	+	16	+	17	+	18	-	19	-	20	=	66
5	12	+	13	+	14	+	15	+	16	+	17	-	18	-	19	-	20	=	30
6	12	+	13	+	14	+	15	+	16	+	17	-	18	-	19	-	20	=	-4
7	12	+	13	+	14	+	15	-	16	-	17	-	18	-	19	-	20	=	-36
8	12	+	13	+	14	-	15	-	16	-	17	-	18	-	19	-	20	=	-66
9.	12	+	13	-	14	+	15	-	16	-	17	-	18	-	19	-	20	=	-94
10	12	-	13	-	14	-	15	-	16	-	17	-	18	-	19	+	20	=	-80
11.	12	-	13	-	14	-	15	-	16	-	17	-	18	+	19	+	20	=	-42
12.	12	-	13	-	14	-	15	-	16	-	17	+	18	+	19	+	20	=	-6

Conver M

1. 4 + 5 - 6 + 7 = 10 ✓	+ - + = 10	1. 8 + 9 + 10 + 11 = 38	+ - + = 18
2. 4 - 5 + 6 - 7 = 0 ✓	- + - = -2	2. 8 + 9 + 10 - 11 = 16	- + - = -2
3. 4 - 5 - 6 + 7 = 0 ✓	- - + = 0	3. 8 + 9 - 10 - 11 = -4	- - + = 0
4. 4 + 5 - 6 - 7 = -4 ✓	+ - - = -4	4. 8 - 9 - 10 + 11 = 0	+ - - = -4
5. 4 + 5 + 6 - 7 = 8 ✓	+ + - = 8	5. 8 - 9 + 10 + 11 = 20	+ + - = 20
6. 4 - 5 + 6 + 7 = 12 ✓	- + + = 12	6. 8 - 9 - 10 + 11 = 0	- + + = 0
7. 4 - 5 - 6 + 7 = -14	- - + = -14	7. 8 + 9 - 10 + 11 = 21	- - + = 21
8. 4 + 5 + 6 + 7 = 22 ✓	+ + + = 22	8. 8 - 9 + 10 - 11 = -2	+ + + = -2

all even

- 4 - 5 + 6 - 7 = -2
- 8 - 9 + 10 - 11 = -2
- 12 - 13 + 14 - 15 = -2
- 16 - 17 + 18 - 19 = -2

when the difference is 1 = -2

difference 1 1 = -222

66,666 - 77,777 + 88,888 - 99,999 = 22,222

What would happen if I used 5 numbers instead of 4?

66,666 - 77,777 + 88,888 - 99,999 + 100,000 = 77,778

no pattern

22,222 - 33,333 + 44,444 - 55,555 + 66,666 - 77,777 + 88,888 - 99,999 = -4,444

4 numbers = -2
8 numbers = -2

$$4 - 6 + 8 - 10 = -4$$

$$10 - 12 + 14 - 16 = -4$$

$$1 - 2 + 3 - 4 = -2$$

$$a - (a+1) + a+2 - (a+3) = -2$$

$$-1 + 2 - 3$$

$$a - (a+2) + a+4 - (a+6) = -4$$

~~10~~ ~~11~~ ~~12~~ ~~13~~

What would happen if I put the numbers going down?

$$13 + 12 - 11 - 10 = 4$$

$$13 + 12 + 11 - 10 = 16$$

$$13 + 12 + 11 + 10 = 46$$

$$13 - 12 + 11 + 10 = 22$$

$$13 - 12 - 11 + 10 = 0$$

$$13 - 12 - 11 - 10 = -20$$

$$13 + 12 - 11 + 10 = 24$$

$$13 - 12 + 11 - 10 = 2$$

all even numbers

When they go up + -- = -4
when it goes down it is + -- = 4

$$10 + 9 - 8 - 7 = 4$$

$$10 + 9 + 8 - 7 = 20$$

$$10 + 9 + 8 + 7 = 34$$

$$10 - 9 + 8 + 7 = 16$$

$$10 - 9 - 8 + 7 = 0$$

$$10 - 9 - 8 - 7 = -14$$

$$10 + 9 - 8 + 7 = 18$$

$$10 - 9 + 8 - 7 = 2$$

+ -- = 4

-- + = 0

- + - = 2

the

$$4 + 5 - 6 - 7 = -4$$

$$4 + 5 + 6 - 7 = 8$$

$$4 + 5 + 6 + 7 = 22$$

$$4 - 5 + 6 + 7 = 12$$

$$4 - 5 - 6 + 7 = 0$$

$$4 - 5 - 6 - 7 = -14$$

$$4 + 5 - 6 + 7 = 10$$

$$4 - 5 + 6 - 7 = 2$$

all even numbers

105

$$35 + 36 - 37 - 38 = -4$$

$$35 + 36 + 37 - 38 = 70$$

$$35 + 36 + 37 + 38 = 146$$

$$35 - 36 + 37 + 38 = 74$$

$$35 - 36 - 37 + 38 = 0$$

$$35 - 36 - 37 - 38 = -76$$

$$35 + 36 - 37 + 38 = 72$$

$$35 - 36 + 37 - 38 = -2$$

$$- + = -2$$

$$- - + = 0$$

$$+ - - = -4$$

$$\begin{array}{r} 35 \\ + 36 \\ 37 \\ 38 \\ \hline 146 \end{array}$$

$$\begin{array}{r} 38 \\ + 38 \\ \hline 76 \end{array}$$

$$\begin{array}{r} 37 \\ + 37 \\ \hline 74 \end{array}$$

$$\begin{array}{r} 34 \\ + 38 \\ \hline 72 \end{array}$$

Daniel Tu 9:3, 10

- Its answers are all even.
- ~~Add~~ There are eight equations without repeating
- $- + - = - 2$

$$4 - 5 + 6 + 7 = 12$$

$$4 - 5 - 6 + 7 = 0$$

$$4 - 5 + 6 - 7 = -2$$

$$4 - 5 - 6 - 7 = -14$$

$$4 + 5 + 6 + 7 = 22$$

$$4 + 5 - 6 + 7 = 10$$

$$4 + 5 + 6 - 7 = 8$$

$$4 + 5 - 6 - 7 = -4$$

$$31 + 32 - 33 - 34 = -4$$

$$31 + 32 + 33 + 34 = 130$$

$$31 + 32 + 33 - 34 = 62$$

$$31 + 32 - 33 + 34 = 64$$

$$31 - 32 + 33 + 34 = 68$$

$$31 - 32 - 33 + 34 = -68$$

$$31 - 32 - 33 + 34 = 0$$

$$31 - 32 + 33 - 34 = -2$$

~~But~~

What would happen if I used a odd number of consecutive numbers.

- There are 4 equations without
- They are still all even
-

$$11 + 12 + 13 = 36$$

$$11 + 12 - 13 = 10$$

$$11 - 12 + 13 = 12$$

$$11 - 12 - 13 = -14$$

~~But~~

$$1 + 2 + 3 = 6$$

$$1 + 2 - 3 = 0$$

$$1 - 2 + 3 = 2$$

$$1 - 2 - 3 = -4$$

$$100 + 101 + 102 = 303$$

$$100 + 101 - 102 = 99$$

$$100 - 101 + 102 = 101$$

$$100 - 101 - 102 = -103$$

- odd numbers for ~~any~~ 100, 101, 102.

$$4 + 5 + 6 - 7 = 8$$

$$4 - 5 + 6 + 7 = 12$$

$$4 + 5 - 6 + 7 = 10$$

$$4 - 5 + 6 - 7 = -2$$

$$4 + 6 + 5 + 7 = 22$$

$$4 - 5 - 6 - 7 = -14$$

$$4 + 6 - 5 + 7 = 12$$

$$4 + 5 + 6 + 7 = 22$$

$$4 + 7 + 5 - 6 = 10$$

ALL

$$4 + 5 + 7 - 6 = 10$$

$$4 + 5 + 6 + 7 = 22$$

$$4 + 5 + 6 - 7 = 8$$

$$4 + 5 + 6 - 7 = 8$$

$$4 + 5 - 6 - 7 = -4$$

$$4 + 7 - 5 + 6 = 12$$

$$4 - 5 - 6 - 7 = -14$$

$$4 - 5 - 6 + 7 = 0$$

$$4 + 5 - 7 + 6 = 8$$

$$4 - 5 + 6 + 7 = 12$$

$$4 - 5 + 6 - 7 = -2$$

$$4 + 5 + 6 + 7$$

$$7 + 8 + 9 + 10 = 36$$

$$7 + 8 + 9 - 10 = 14$$

$$7 + 8 - 9 + 10 = 16$$

$$7 - 8 + 9 + 10 = 18$$

$$7 + 8 - 9 - 10 = -4$$

$$7 - 8 + 9 - 10 = -2$$

$$7 - 8 - 9 + 10 = 0$$

$$7 - 8 - 9 - 10 = -20$$

} all even

"What would happen if...
I used negative numbers?"

$$-7 + -6 + -5 + -4 = -22$$

$$-7 + -6 + -5 - -4 = -14$$

$$-7 + -6 - -5 + -4 = -12$$

$$-7 - -6 + -5 + -4 = -10$$

$$\cancel{-7 + -6 - -5 - -4 + -4}$$

$$\cancel{-7 - -6 + -5 - -4} = -2$$

$$\cancel{-7 - -6 - -5 + -4} = 0$$

$$-7 - -6 - -5 - -4 = 8$$

$$-20 + -21 + -22 + -23 = -86$$

$$-20 + -21 + -22 - -23 = -40$$

$$-20 + -21 - -22 + -23 = -42$$

$$-20 - -21 + -22 + -23 = -44$$

$$\cancel{-20 + -21 - -22 - -23} = 4$$

$$\cancel{-20 - -21 + -22 - -23} = 2$$

$$\cancel{-20 - -21 - -22 + -23} = 0$$

$$-20 - -21 - -22 - -23 = -46$$

When numbers are going up, are negative, When going up, are positive.

LUCY DOUGLASS

9, 10, 11, 12

4	+	5	-	6	+	7	=	1
4	-	5	-	6	-	7	=	-1
4	+	5	+	6	+	7	=	2
4	-	5	+	6	-	7	=	-2
4	+	5	+	6	-	7	=	8
4	-	5	+	6	+	7	=	1
4	+	5	-	6	-	7	=	-4
4	-	5	-	6	+	7	=	0

1st try

Similarities of these two sets:

9	+	10	-	11	+	12	=	2
9	-	10	-	11	-	12	=	-2
9	+	10	+	11	+	12	=	4
9	-	10	+	11	-	12	=	-2
9	+	10	+	11	-	12	=	18
9	-	10	+	11	+	12	=	2
9	+	10	-	11	-	12	=	-4
9	-	10	-	11	+	12	=	0

What would happen if I changed the equation to $x \text{ and } \neq !$

6, 7, 8, 9

6	x	7	x	8	x	9	=	3024	← same amount of numbers
6	x	7	x	8	÷	9	=	37.3333	continue
6	x	7	≠	8	÷	9	=	4.6666	continue
6	÷	7	÷	8	÷	9	=	0.0119047	
6	÷	7	÷	8	x	9	=	0.9642852	
6	÷	7	x	8	x	9	=	7.7142852	
6	x	7	÷	8	x	9	=	378	
6	÷	7	x	8	÷	9	=	0.7619047	2nd try

Nothing so similar as the last bunch in this bunch!

7, 8, 9, 10

7	x	8	x	9	x	10	=	7050	← same amount of numbers
7	x	8	x	9	÷	10	=	70.2	
7	x	8	÷	9	÷	10	=	0.62222	continue
7	÷	8	÷	9	÷	10	=	0.0097222	
7	÷	8	x	9	x	10	=	8.75	
7	÷	8	x	9	x	10	=	7020	
7	x	8	÷	9	x	10	=	560	
7	÷	8	x	9	÷	10	=	0.7875	

I'm not going to try; I used a calculator.

Workings out:

WHAT WILL HAPPEN IF...

consecutive square numbers

$$+4 + 9 + 16 = 30$$

$$+4 + 9 - 16 = -2$$

$$+4 - 9 - 16 = -20$$

$$-4 - 9 - 16 = -28$$

$$-4 - 9 + 16 = 4$$

$$-4 + 9 + 16 = 22$$

$$-4 + 9 - 16 = -10$$

$$+4 - 9 + 16 = 12$$

--- = 8 on the end of result

---+ = 4 all the time.

$$+16 + 25 + 36 = 86$$

$$+16 + 25 - 36 = 14$$

$$+16 - 25 - 36 = -36$$

$$-16 - 25 - 36 = -68$$

$$-16 - 25 + 36 = 4$$

$$-16 + 25 + 36 = 54$$

$$-16 + 25 - 36 = -18$$

03.10

e Haddad

28
-43
40
-44
21

$41 + 42 - 43 + 44 = 84$

$41 - 42 - 43 + 44 = 0$

$5 - 6 + 7 = 10 \checkmark$

$41 - 42 + 43 - 44 = -2$

$5 - 6 + 7 = 0 \checkmark$

2

$41 + 42 + 43 - 44 = 182$

$5 + 6 - 7 = -2 \checkmark$

3

$41 - 42 - 43 - 44 = -88$

$5 + 6 - 7 = 8 \checkmark$

4

$41 + 42 + 43 + 44 = 170$

$5 - 6 - 7 = -14 \checkmark$

5

$41 - 42 + 43 + 44 = 86$

$5 + 6 + 7 = 22 \checkmark$

6

$41 \oplus 42 \ominus 43 \ominus 44 = -4$

$5 + 6 + 7 = 12 \checkmark$

7

$5 \ominus 6 \ominus 7 = -4 \checkmark$



WHAT WOULD HAPPEN IF...?

~~starting on a negative...~~
consecutive ^{square} whole number

$+4 - 9 + 16 = ~~25~~ 12$

1

$4 \quad 9 \quad 16$

$+4 - 9 - 16 =$

1

$4 \quad 9 \quad 16$

$+4 + 9 - 16 =$

\dots