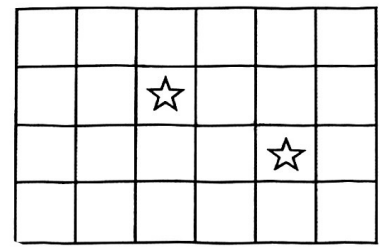
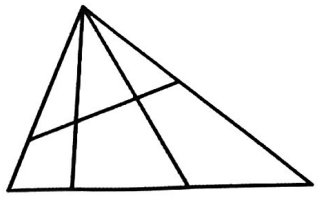
4 A 6×4 grid is shown below.



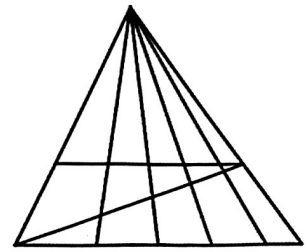
(3) There are _____ rectangles with only one star inside.

Dancing with the Stars

1 There are _____ triangles in the picture below.



(3) There are _____ triangles in the picture below.



Practice 4

In a sequence, the first number is 3, and the second number is 10. Starting from the third number, each number is the sum of the two nearest numbers before it. What is the remainder when the 2016^{th} number in the sequence is divided by 4?

(4) Starting from the third number in the sequence 1, 2, 3, 5, 8, 13, 21, ……, each number is the sum of two numbers before it. What is the remainder when the 3435^{th} number in the sequence is divided by 4?

(3) $(26798 \times 5995 \times 58661) \div 3$ R _____ .

2 In a sequence, the first number is 3, and the second number is 4. Starting from the third number, each number is the sum of the two numbers before it. When the 2021^{st} number in the sequence is divided by 4, the remainder is _____

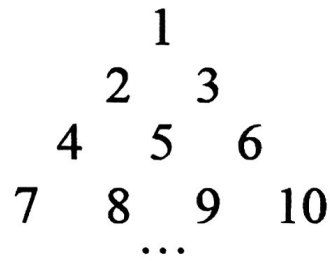
3 In a sequence, the first number is 2, and the second number is 3. Starting from the third number, each number is the sum of the nearest two numbers before it. When the 404^{th} number in the sequence is divided by 4, the remainder is _____ .

4 In a sequence, the first number is 2; the second number is 3. Starting from the third number, each number is the sum of the nearest two numbers before it. When the 2015^{th} number in the sequence is divided by 3, the remainder is _____ .

Math Exploration 3

Continuous natural numbers starting from 1 are arranged in the picture shown below. Observe the pattern and answer the questions below.

(1) The 4^{th} number counting from the left side of the 7^{th} row is _____ .



(2) 35 is the _____ th number in row _____ .

Math Exploration 4

Here is the famous Yanghui Triangle Numerical Table. Find the patterns in the table and answer the questions.

(1) The 2^{nd} number counting from the left side of the 8^{th} row is _____ .

(2) When there are 14 rows in the table, there are _____ numbers in total.

(3) The sum of all numbers in the 9^{th} row is _____

			1			
		1		1		
	1		2		1	
1		3		3		1
	1		4		6		4		1
1		5		10		10		5		1
…		…		…		…		…		…	…

Eddie and Avril are playing a game. Eddie fills some natural numbers in a rectangular numerical table as the picture shown on the top. Avril fills natural numbers in a triangular numerical table as the picture shown at the bottom. They want to find the locations of 100 in their own numerical tables. In Eddie's numerical table, 100 is in row _____ , column _____. In Avril's numerical table, 100 is the _____ th number counting from the left of row _____

2	4	6	8	10
12	14	16	18	20
22	24	26	28	30
32	34	36	38	40
.....				

1

2 3

4 5 6

7 8 9 10

...

2 Continuous natural numbers starting from 1 are arranged in the picture shown below.

1	2	3	4
5	6	7	8
9	10	11	12
	…	…	

(3) The sum of all numbers in the first 9 rows is _____ .

3 Continuous natural numbers starting from 1 are arranged in the picture shown below.

(1) 109 is in row _____ , column _____ .

1	5	9	13
2	6	10	14
3	7	11	15
4	8	12	16

4 Observe the pattern below and answer the questions.

(1) 200 is in row _____ , column _____ .

2	4	6	8
10	12	14	16
18	20	22	24
26	28	30	32

(2) The number in row 40, column 3 is _____ .

(3) The sum of all the numbers in the first 9 rows is _____

1 Continuous odd numbers starting from 1 are arranged in the picture shown below.

(1) 101 is in row _____ , column _____ .

1	3	5	7	9	11	13
15	17	19	21	23	25	27
29	31	33	35	37	39	41

(2) The number in row 21, column 3 is _____ .

2 Continuous natural numbers starting from 1 are arranged in the picture shown below. Observe the pattern and answer the questions below.

(1) The 5^{th} number counting from the left side of the 14^{th} row is _____ .

1

2 3

4 5 6

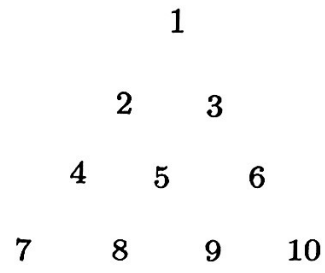
7 8 9 10

...

(2) 83 is the _____ th number in row _____ .

3 Continuous natural numbers starting from 1 are arranged in the picture shown below. Observe the pattern and answer the questions below.

(1) The 8^{th} number counting from the left side of the 17^{th} row is _____



(2) 129 is the _____ th number in row _____

Dancing with the Stars

1. Here is the famous Yanghui Triangle Numerical Table.

When there are 10 rows in the table there are _____ numbers in total.

The sum of all numbers in row 10 is _____ .

1

1 1

1 2 1

1 3 3 1

1 4 6 4 1

1 5 10 10 5 1

… … … … … …

2. Observe the pattern below and answer the questions.

(1) The 4^{th} number in row 15 is _____ .

1

2 3

6 5 4

7 8 9 10

… 12 11

2 Nineteen ducks are distributed among three cages. There is at least one duck in each cage. If no two of the cages contain the same number of ducks, then for the cage that contains the most ducks, the smallest possible number of ducks in that cage is _____ .

3, 2, 1 LIFT OFF

1. The word 'THINK' represents a five-digit number. If the different letters represent different digits, then the smallest possible number the word 'THINK' can represent is _____ .

1 Find the perfect squares among the followings and the sum of their square roots is _____ .

68, 134, 289, 630, 784, 848.

4 Among the natural numbers from 1 to 1000, there are _____ numbers which have odd numbers of factors; there are _____ numbers which have only 3 factors.

2 When $1^2 + 2^2 + 3^2 + \cdots + 2020^2$ is divided by 4, the remainder is _____ .