



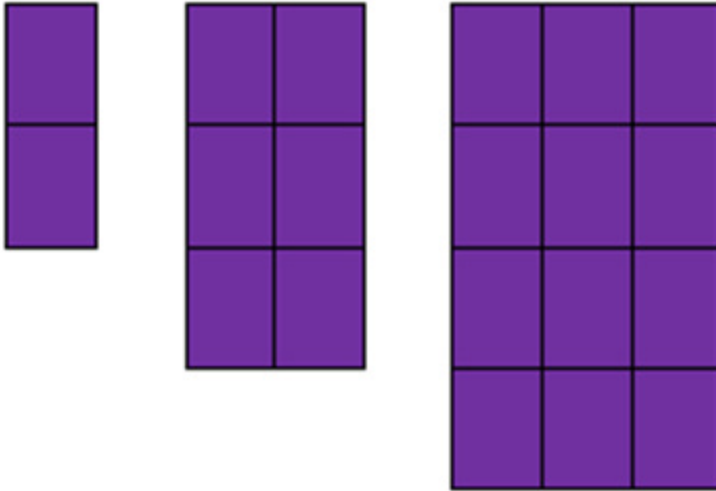
- Is this pattern an arithmetic sequence , geometric sequence , or arithmetic series? Explain your reasoning.
- Find the 14 term, 26th term, and 32nd term. Show work to receive credit.
- How snowflakes would be in the 120th term? Show work.

Fill out the table for the first 6 terms to this sequence above.

x	y
1	
2	
3	
4	
5	

- Use the pattern above to calculate the 43rd term. Show your work.

- Why would the figure be an arithmetic sequence? Explain your reasoning.



- What is the formula used to solve this equation?
- Now find the 100th, 200th, and 340th term. Show work.

Answer Key

1. Arithmetic Sequence because you're adding 3.
2. 14 term= $a(14)=3+(14-1)(3)$

$$3+13(3)$$

$$3+39$$

$$\mathbf{42}$$

$$26\text{th term} = a(26) = 3 + (26-1)(3)$$

$$3+25(3)$$

$$3+75$$

$$\mathbf{78}$$

$$32\text{nd term} = a(32) = 3 + (32-1)(3)$$

$$3+31(3)$$

$$3+93$$

$$\begin{aligned}
 3. \text{ 120th term} &= a(120) = 3 + (120-1)(3) \\
 &= 3 + 119(3) \\
 &= 3 + 357 \\
 &= \mathbf{360}
 \end{aligned}$$

4

x	y
1	6
2	9
3	12
4	15
5	18

$$\begin{aligned}
 5. \text{ 43rd term} &= a(43) = 3 + (43-1)(3) \\
 &= 3 + 42(3) \\
 &= 3 + 126 \\
 &= \mathbf{129}
 \end{aligned}$$

6. It would be an arithmetic sequence because it adds 3 every time.

$$7. s_n = n(a_1 + a_n)/2$$

$$\begin{aligned}
 8. s_n &= 2(12 + 100)/2 \\
 &= 2(112)/2 \\
 &= 224/2 \\
 &= \mathbf{112}
 \end{aligned}$$

$$\begin{aligned}
 \text{200th term} - s_n &= 2(12 + 200)/2 \\
 &= 2(212)/2 \\
 &= 424/2 \\
 &= \mathbf{212}
 \end{aligned}$$

$$\begin{aligned}
 \text{340th term} - s_n &= 2(12 + 340)/2 \\
 &= 2(352)/2 \\
 &= 704/2 \\
 &= \mathbf{352}
 \end{aligned}$$



1. Is this an arithmetic sequence, geometric sequence or neither? Explain your answer.
2. What would be the 10th term be for the pattern above? Explain your answer.
3. If it is a geometric, what is the most common ratio? Explain your reasoning
4. What is going on in this pattern? Explain.

Answer Key

1. Arithmetic because it goes up by one each time.
2. 11 because you have to do your formula.
3. It is not geometric it is arithmetic so it does not have a common ratio.
4. It is adding 1 each time it goes up.



1. Is this pattern a Geometric, Arithmetic, or neither? Explain the reasoning for your answer.

2. Explain what is going on in this pattern. How do you know this?

3. What would the 15th term for this pattern? Explain how you did this?

4.

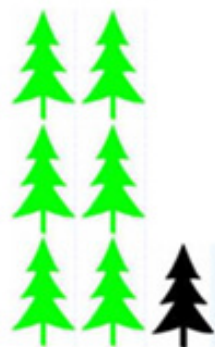
x	y
1	2
2	4
3	7
4	
5	
6	
7	
8	
9	
10	

Fill in the rest of the table.

Answer Key

1. It is neither because it is not adding/subtracting or multiplying/dividing by the same number.
2. In this pattern there is no common difference or common ratio but it is going up by different numbers each time.
3. The 15th term is 121 because if you use the table it comes out to be 121.
- 4.

x	y
1	2
2	4
3	7
4	11
5	16
6	22
7	29
8	37
9	46
10	56



I have given you the first three steps of a pattern.

Fill out the table below for the first 15 steps of the equation.

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

How many squares would be in the:

- The 20th pattern
 - The 25th pattern
 - The 30th pattern
-
- In my findings I found that the 30th pattern has 61 trees. If my work is right or wrong please explain and show your work.
 - In my findings I found that the 50th term is 101. Is my work right or wrong. Explain why.
 - My theory for the 70th term would be 141. Check my work and see if it is true or false.
 - How would you calculate to get the next value?

Answer key

x	y
1	3
2	5
3	7
4	9
5	11
6	13
7	15
8	17
9	19
10	21
11	23
12	25
13	29
14	31
15	33

How many squares would be in the:

- The 20th pattern = 41
 - The 25th pattern = 51
 - The 30th pattern = 61
-
- In my findings I found that the 30th pattern has 61 trees. If my work is right or wrong please explain and show your work.

The work is right because it goes up by two each time and whenever you add two each time 30 different times you get 61.

- In my findings I found that the 50th term is 101. Is my work right or wrong. Explain why. The work is right because when you continue going up by two add you hit the 50 term it will be 101 trees.

- My theory for the 70th term would be 141. Check my work and see if it is true or false.

It is true

- How would you calculate to get the next value?

$2(n)+2-1$ is how you would calculate to get the answer. You get the first two by how many times it goes up. You multiply that by the term you are trying to find. You would add how many times it goes up and subtract one.



Above is the first four patterns.
Using this chart fill out the table.

x	y
1	1
2	3
3	5
4	7
5	9
6	11
7	13
8	15

- 1.) How Many Puppies Would Be In Group 12?
- 2.) If You Had 61 Puppies What Group Number Would You Be?
- 3.) What Does The Pattern Increase By?
- 4.) How Many Puppies Would You Have If You Subtracted Group 15 By Group 11?

Answer Key (DON'T LOOK TILL FINISHED)

1. 23 Puppies
2. Group 31
3. Increases By 2
4. 28 Puppies



Above are the first four steps in the patterns
For the table below fill out the first 6 steps. SHOW YOUR WORK!

x	y
1	
2	
3	
4	
5	
6	

After finding the first six steps solve for the following steps:

- ★ 12th step
- ★ 24th step
- ★ 33rd step

What is the explicit formula for the problem above?

For step 16 I got 19 stars. Is the calculations for 16 correct or incorrect? Explain why or why not.

ANSWER KEY

x	y
1	3
2	5
3	7
4	9
5	11
6	13

★ 12th step = 25

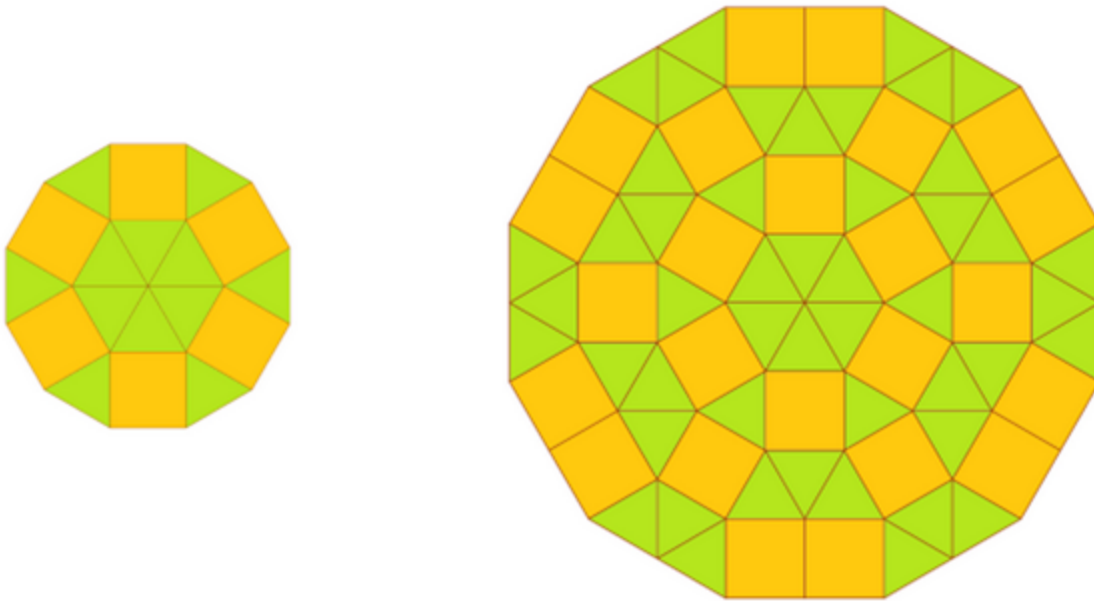
★ 24th step = 49

★ 33rd step = 67

Explicit Formula:

$$a_n = 2n + 1$$

Step 16 has 33 stars, but if you look on the 12th step you already have more starts on the 12th step then what 16 is asking



Task One: count each of the yellows on the outside ring of each circle and tell me what the pattern is .

Task Two: if that pattern continues how many yellows will be in the outer ring in the following sequences?

- a) 5th sequence
- b) 11th sequence
- c) 25th sequence

Task Three: What's the green to yellow ratio in each circle?

Answer Key-

Task One: 6 yellows on the first ring, 12 yellows on the second ring.

Task Two:

- a) 36 yellows
- b) 72 yellows
- c) 156 yellows

Task Three:

Circle one- 12 to 6

Circle two- 48 to 24