ARITHMETIC SEQUENCES.   Find the next few terms in the sequence and then find the requested term.

1)   **2 ,   4 ,   6 ,   8** , ____ , _____ , _____ ....   Find a_{42}=_____

| Determine the RECURSIVE DEFINITION: | Determine the EXPLICIT DEFINITION: |

2) **5 ,   8,   11 ,   14** , _____ , _____ , _____ ....   Find a_{33}=_____

| Determine the RECURSIVE DEFINITION: | Determine the EXPLICIT DEFINITION: |

3) **10 ,   7 ,   4,   1,** ____ , _____ , _____ ....   Find a_{29}=_____

| Determine the RECURSIVE DEFINITION: | Determine the EXPLICIT DEFINITION: |

4) **Josh was making a sequence pattern out of triangle pattern blocks.**

a_1 a_2 a_3 a_4 a_5 a_6 a_7
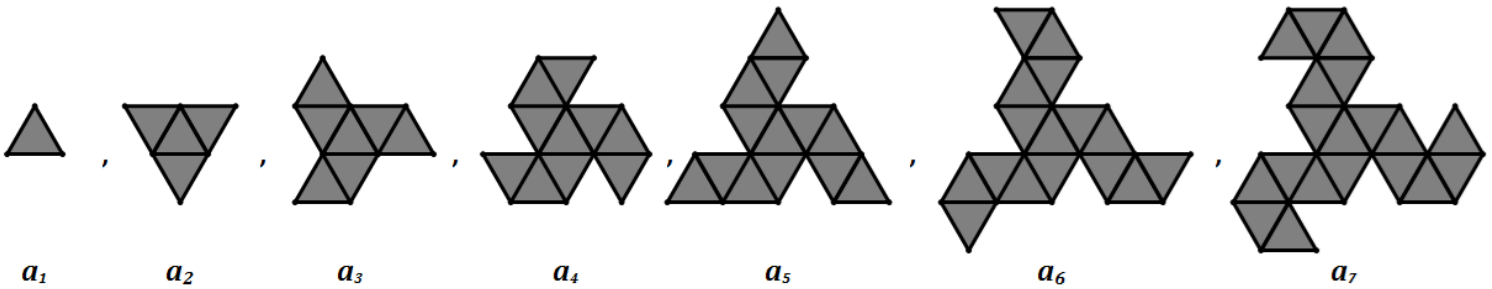
If Josh continues this pattern, how many triangles will he need to make the 20th step of this pattern?

Functions can be used as explicit definitions for a sequence:
Consider the sequence: 4, 7, 10, 13, 16, 19, 22, 25,.......... The function $f(x) = 4 + (x - 1)3$ could be used define the sequence where x = the term number. The domain would be {1, 2, 3, 4, ...} and the range would be {4, 7, 10, 13, ...}

5) Create a sequence based on the function: $f(x) = 4x - 1$

6) Describe the **domain** and **range** of a function that might describe the sequence of {14, 11, 8, 5, ...}

7) Determine the **common difference** of the sequence and write a function that could be used to describe the sequence: {14, 11, 8, 5, ...}
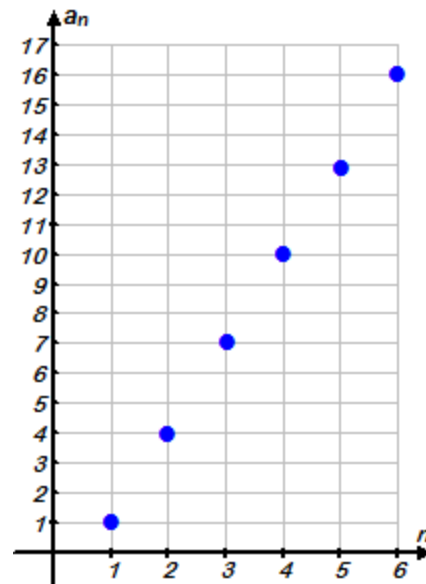
8) Write a **_recurrence relation_** and an **_explicit definition_** for the following table:

n	1	2	3	4	5	....
a_n	5	7	9	11	13	....

RECURRENCE RELATION:

EXPLICIT DEFINITION:

9) Write a **recurrence relation** and an **explicit definition** for the following graph:

RECURRENCE RELATION:

EXPLICIT DEFINITION:

GEOMETRIC SEQUENCES. **Find the next few terms in the sequence and then find the requested term.**

10) **3 ,   6 ,   12 ,   24** , ____ , _____ , _____ ....   Find $a_{24}=$_____

RECURRENCE RELATION:

EXPLICIT DEFINITION:

11) **2 ,   – 6,   18 ,   – 54** ,   _____ , _____ , _____ ....   Find $a_{16}=$_____

RECURRENCE RELATION:

EXPLICIT DEFINITION

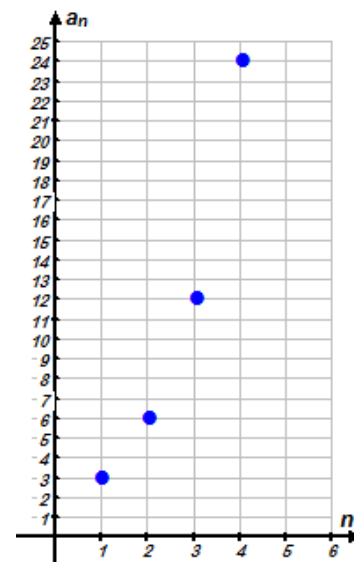12) Create a sequence based on the function: $f(x) = 5 \cdot 2^x$

13) Write a **recurrence relation** and an **explicit definition** for the following table:

n	1	2	3	4	5	....
a_n	2	10	50	250	1250	....

RECURRENCE RELATION:

EXPLICIT DEFINITION:

14) Write a **recurrence relation** and an **explicit definition** for the following graph:

RECURRENCE RELATION:

EXPLICIT DEFINITION:

SEQUENCES

15) Given that a sequence is **arithmetic**, $a_1 = 5$, and the common difference is 4, find a_{37}.

16) Given that a sequence is **arithmetic**, $a_{52} = 161$, and the common difference is 3, find a_1.

17) Given that a sequence is **geometric**, the first term is 1536, and the common ratio is ½, find the 7th term in the sequence.

18) Given that a sequence is **geometric**, $a_{10} = 98415$, and the common ratio is 3, find a_1.

19) The value of an ounce of silver is about $16 and over the last several years silver has increased in value by about 7%. How much should an ounce of silver be worth 20 years from now?

20) A person was having a graduation party and noticed that only 5 people were there after the first hour but grew in size by 61% every hour. If the size of the party grew this way for 6 hours, how many people would be at the party on the 6th hour?

21) Jessica is creating a drawing on her paper called a Binary Tree.

a_1 , a_2 , a_3 , a_4 , a_5
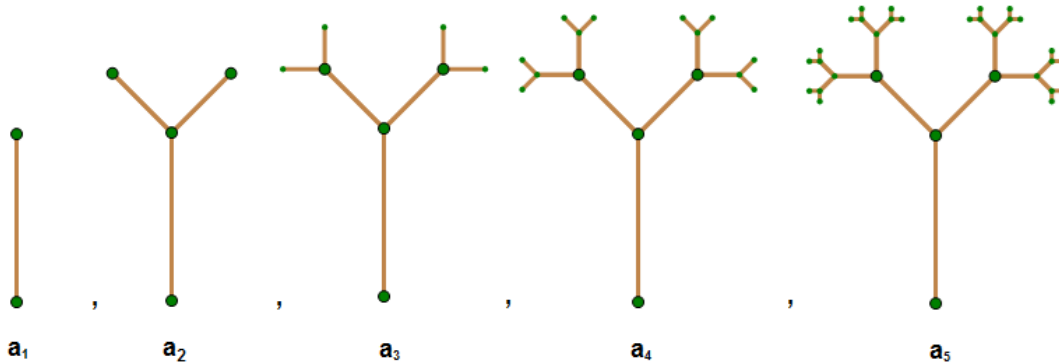
If Jessica continue drawing more and more branches, how many new branches would she need to draw on the 12th step?