SEQUENCES

A NUMERICAL SEQUENCE

A.1 FINDING NEXT TERM IN ARITHMETIC SEQUENCE

Ex 1: What is the 6th term of this sequence?

n	1	2	3	4	5	6
n^{th} term	3	5	7	9	11	13

Answer: The 6th term is 13, because each term increases by 2.

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

+2 +2 +2 +2 +2

Ex 2: What is the 6th term of this sequence?

n	1	2	3	4	5	6
n^{th} term	3	8	13	18	23	28

Answer: The 6th term is 28, because each term increases by 5.

1	2	3	4	5	6
3	8	13	18	23	28

+5 +5 +5 +5 +5

Ex 3: What is the 5th term of this sequence?

n	1	2	3	4	5
n^{th} term	20	18	16	14	12

Answer: The 5th term is 12, because each term decreases by 2.

1	2	3	4	5
20	18	16	14	12

−2 −2 −2 −2

Ex 4: What is the 6th term of this sequence?

n	1	2	3	4	5	6
n^{th} term	80	70	60	50	40	30

Answer: The 6th term is 30, because each term decreases by 10.

1	2	3	4	5	6
80	70	60	50	40	30

−10 −10 −10 −10 −10

A.2 FINDING A TERM IN ARITHMETIC SEQUENCE

Ex 5: What is the 6th term of this sequence?

n	1	2	3	4	...	6
n^{th} term	3	5	7	9	...	13

Answer: The 6th term is 13, because each term increases by 2.

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

+2 +2 +2 +2 +2

Ex 6: What is the 5th term of this sequence?

n	1	2	3	...	5	n^{th} term

Answer: The 5th term is 3, because each term decreases by 3.

1	2	3	4	5
15	12	9	6	3

−3 −3 −3 −3

Ex 7: What is the 6th term of this sequence?

n	1	2	3	...	6	n^{th} term

Answer: The 6th term is 27, because each term increases by 4.

1	2	3	4	5	6
7	11	15	19	23	27

+4 +4 +4 +4 +4

Ex 8: What is the 5th term of this sequence?

n	1	2	3	...	5	n^{th} term	50

Answer: The 5th term is 26, because each term decreases by 6.

1	2	3	4	5
50	44	38	32	26

−6 −6 −6 −6

A.3 FINDING NEXT TERM IN GEOMETRIC SEQUENCE

Ex 9: What is the 6th term of this sequence?

n	1	2	3	4	5	6
n^{th} term	2	4	8	16	32	64

Answer: The 6th term is 64, because each term is multiplied by 2.

1	2	3	4	5	6
2	4	8	16	32	64

×2 ×2 ×2 ×2 ×2

Ex 10: What is the 5th term of this sequence?

n	1	2	3	4	5
n^{th} **term**	**1**	**3**	**9**	**27**	81

Answer: The 5th term is 81, because each term is multiplied by 3.

1	2	3	4	5
1	3	9	27	81
	×3	×3	×3	×3

Ex 11: What is the 6th term of this sequence?

n	1	2	3	4	5	6
n^{th} **term**	**64**	**32**	**16**	**8**	**4**	2

Answer: The 6th term is 2, because each term is divided by 2.

1	2	3	4	5	6
64	32	16	8	4	2
	÷2	÷2	÷2	÷2	÷2

Ex 12: What is the 5th term of this sequence?

n	1	2	3	4	5
n^{th} **term**	**243**	**81**	**27**	**9**	3

Answer: The 5th term is 3, because each term is divided by 3.

1	2	3	4	5
243	81	27	9	3
	÷3	÷3	÷3	÷3

Ex 13: What is the 6th term of this sequence?

n	1	2	3	4	5	6
n^{th} **term**	**3**	**6**	**12**	**24**	**48**	96

Answer: The 6th term is 96, because each term is multiplied by 2.

1	2	3	4	5	6
3	6	12	24	48	96
	×2	×2	×2	×2	×2

A.4 FINDING RULES IN GEOMETRIC PATTERNS

Ex 14: Observe the following pattern made with sticks:

Fill in the table below:

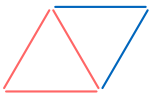
Diagram number	1	2	3	4
Number of sticks	3	5	7	9

What rule can you find for the number of sticks?
Start with 3 sticks. Add 2 sticks for the next diagram.

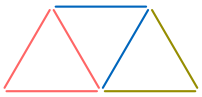
Answer:

- For diagram number 1, the number of sticks is 3.

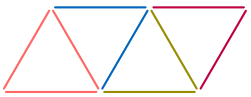
- For diagram number 2, the number of sticks is 5.



- For diagram number 3, the number of sticks is 7.



- For diagram number 4, the number of sticks is 9.



- **Rule:** Start with 3 sticks, and add 2 sticks for the next diagram.

Ex 15: Observe the following pattern made with sticks:

Fill in the table below:

Diagram number	1	2	3	4
Number of sticks	4	7	10	13

What rule can you find for the number of sticks?
Start with 4 sticks. Add 3 sticks for the next diagram.

Answer:

- For diagram number 1, the number of sticks is 4.

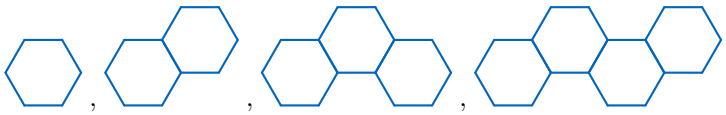
- For diagram number 2, the number of sticks is 7.

- For diagram number 3, the number of sticks is 10.

- For diagram number 4, the number of sticks is 13.

- **Rule:** Start with 4 sticks, and add 3 sticks for the next diagram.

Ex 16: Observe the following pattern made with sticks:



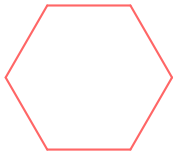
Fill in the table below:

Diagram number	1	2	3	4
Number of sticks	6	11	16	21

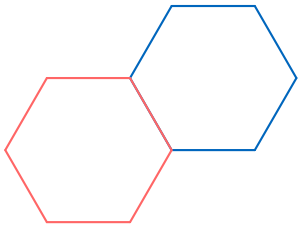
What rule can you find for the number of sticks?
Start with 6 sticks. Add 5 sticks for the next diagram.

Answer:

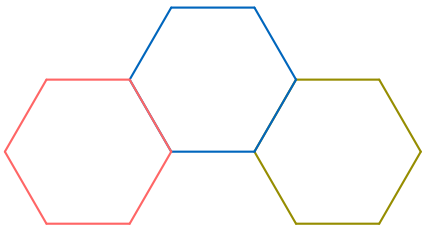
- **Diagram 1 :** For 1 hexagon, the number of sticks is 6.



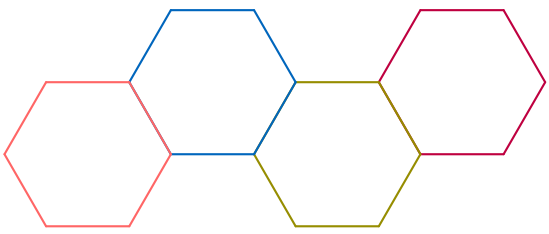
- **Diagram 2 :** For 2 hexagons, the number of sticks is 11.



- **Diagram 3 :** For 3 hexagons, the number of sticks is 16.



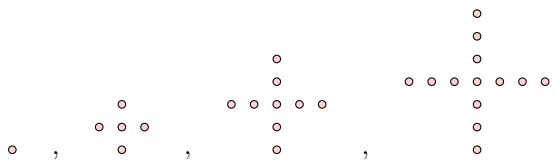
- **Diagram 4 :** For 4 hexagons, the number of sticks is 21.



- **Rule:** Start with 6 sticks, and add 5 sticks for each additional hexagon.

A.5 FINDING RULES IN DOT PATTERNS

Ex 17: Observe the following pattern made with dots:



Fill in the table below:

Diagram number	1	2	3	4
Number of dots	1	5	9	13

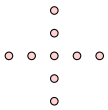
What rule can you find for the number of dots?
Start with 1 dot. Add 4 more dots for each new diagram.

Answer:

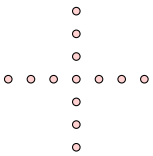
- For diagram number 1, the number of dots is 1.

- For diagram number 2, the number of dots is 5.

- For diagram number 3, the number of dots is 9.



- For diagram number 4, the number of dots is 13.



- **Rule:** Start with 1 dot, and add 4 dots for each new diagram.

Ex 18: Observe the following pattern made with dots:

Fill in the table below:

Diagram number	1	2	3	4
Number of dots	1	3	5	7

What rule can you find for the number of dots?
Start with 1 dot. Add 2 more dots for each new diagram.

Answer:

- For diagram number 1, the number of dots is 1.

- For diagram number 2, the number of dots is 3.

- For diagram number 3, the number of dots is 5.

- For diagram number 4, the number of dots is 7.

- **Rule:** Start with 1 dot, and add 2 dots for each new diagram.