ONLINE MATHS CLASS - X - 07 (01 / 07 /2021)

1. ARITHMETIC SEQUENCE - CLASS 5

What did we study in the last class ?

- **The difference between any two terms of an arithmetic sequence is the product of the difference of positions and the common difference**
- $$Common\ \ difference\ = \frac{Term\ \ difference}{Position\ \ difference}$$

Activity 1

Fill up the empty cells of the given square such that the numbers in each row and column form arithmetic sequences . The numbers must be consecutive terms of an arithmetic sequence .

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

NOTE : Let's use other appropriate numbers too .

Activity 2

Fill up the empty cells of the given square such that the numbers in each row and column form arithmetic sequences . The numbers must be consecutive terms of an arithmetic sequence .

2			
			32

Answer

$$Common\ \ difference = \frac{Term\ \ difference}{Position\ \ difference} = \frac{x_{16}-x_1}{16-1} = \frac{32-2}{16-1} = \frac{30}{15} = 2$$

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

Activity 3

Fill up the empty cells of the given square such that the numbers in each row and column form arithmetic sequences . The numbers must be consecutive terms of an arithmetic sequence .

1			
			31

Answer

$$Common\ \ difference = \frac{Term\ \ difference}{Position\ \ difference} = \frac{x_{16}-x_1}{16-1} = \frac{31-1}{16-1} = \frac{30}{15} = 2$$

1	**3**	**5**	**7**
9	**11**	**13**	**15**
17	**19**	**21**	**23**
25	**27**	**29**	**31**

Activity 5

Fill up the empty cells of the given square such that the numbers in each row and column form arithmetic sequences .

1			**4**
7			**28**

Answer

	First term	Fourth term	Common difference
First row	**1**	**4**	$\frac{4-1}{4-1} = \frac{3}{3} = 1$
Fourth row	**7**	**28**	$\frac{28-7}{4-1} = \frac{21}{3} = 7$
First column	**1**	**7**	$\frac{7-1}{4-1} = \frac{6}{3} = 2$
Fourth columns	**4**	**28**	$\frac{28-4}{4-1} = \frac{24}{3} = 8$

1	2	3	4
3			12
5			20
7	14	21	28

Similarly we can find the common difference of other rows and columns .

	First term	Fourth term	Common difference
Second row	3	12	$\frac{12-3}{4-1} = \frac{9}{3} = 3$
Third row	5	20	$\frac{20-5}{4-1} = \frac{15}{3} = 5$
Second column	2	14	$\frac{14-2}{4-1} = \frac{12}{3} = 4$
Third column	3	21	$\frac{21-3}{4-1} = \frac{18}{3} = 6$

1	2	3	4
3	6	9	12
5	10	15	20
7	14	21	28

Activity 6

How many terms are there in the arithmetic sequence 101 , 108 , 115 , . . . , 997 ?

Answer

Common difference = 108 – 101 = 7

Term difference = 997 - 101 = 896

Position difference $= \frac{Term\ \ difference}{Common\ \ Difference} = \frac{896}{7} = 128$

Number of terms = 128 + 1 = 129

Activity 7

How many natural numbers are there which leave a remainder 3 on division by 7 ?

Answer

First number = 101

Last number = 997

(The sequence of natural numbers are there which leave a remainder 3 on division by 7 is an arithmetic sequence . 101 , 108 , 115 , . . . , 997)

Common difference = 108 – 101 = 7

Term difference = 997 - 101 = 896

Position difference $= \frac{Term\ \ difference}{Common\ \ Difference} = \frac{896}{7} = 128$

Number of terms = 128 + 1 = 129

Activity 8

How many natural numbers are there which leave a remainder 2 on division by 3 ?

Answer

First number = 11

Last number = 98

(The sequence of natural numbers are there which leave a remainder 2 on division by 3 is an arithmetic sequence . 11 , 14 , 17 , . . . , 98)

Common difference = 14 – 11 = 3

Term difference = 98 – 11 = 87

Position difference $= \frac{Term\ \ difference}{Common\ \ Difference} = \frac{87}{3} = 29$

Number of terms = 29 + 1 = 30