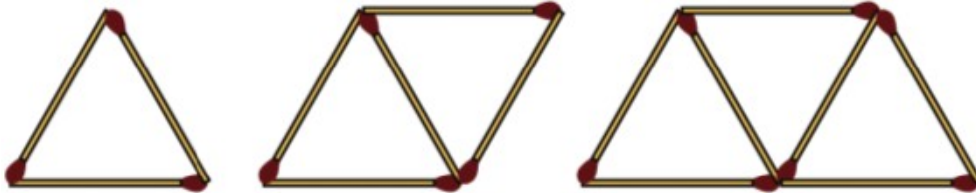


# ONLINE MATHS CLASS - X - 3 ( 21 / 06 /2021 )

## 1. ARITHMETIC SEQUENCE - CLASS 1

### WORKSHEET – ANSWERS

1. Let's make figures using matchsticks as shown in the figure.

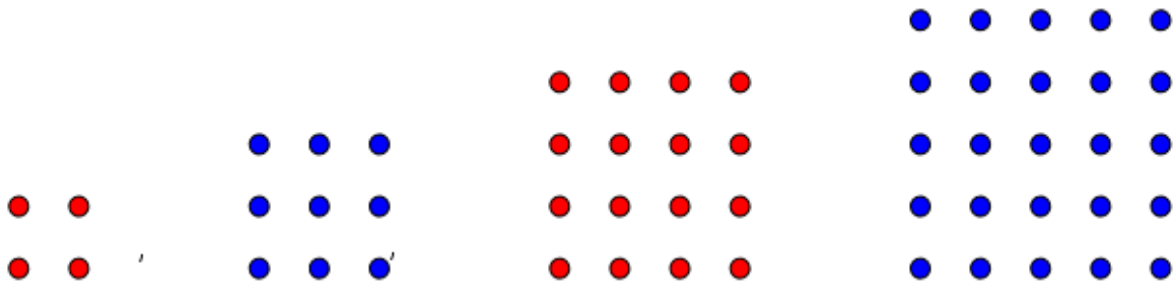


- How many matchsticks are there in the first figure (triangle) ?
- If we continue like this , how many matchsticks will be there in the fourth figure ?
- If we continue this process , write the sequence of number of matchsticks in each figure ?

Answer.

- 3
- 9
- 3, 5, 7, 9, 11, 13, ...

2. Let's make squares with dots .



- How many dots are there in the first square ?
- If we continue like this , how many dots will be there in the fifth square ?
- If we continue this process , write the sequence of number of dots in each square ?

Answer.

- 4

b) 36

c) 4, 9, 16, 25, 36, 49, ...

3. a) Write down the sequence of natural numbers ending in 2 .

b) Write down the sequence of natural numbers ending in 2 or 7 .

Answer.

a) 2, 12, 22, 32, 42, 52, ...

b) 2, 7, 12, 17, 22, 27, ...

4. a) Write the sequence of natural numbers which leave a remainder 2 on division by 5 .

b) Write the sequence of numbers got by subtracting 3 from 5 times the natural numbers

Answer.

a) 2, 7, 12, 17, 22, 27, ...

b) {  $5 \times 1 - 3 = 5 - 3 = 2$

$$5 \times 2 - 3 = 10 - 3 = 7$$

$$5 \times 3 - 3 = 15 - 3 = 12$$

$$5 \times 4 - 3 = 20 - 3 = 17$$

$$5 \times 5 - 3 = 25 - 3 = 22$$

$$5 \times 6 - 3 = 30 - 3 = 27$$

..... }

2, 7, 12, 17, 22, 27, ...

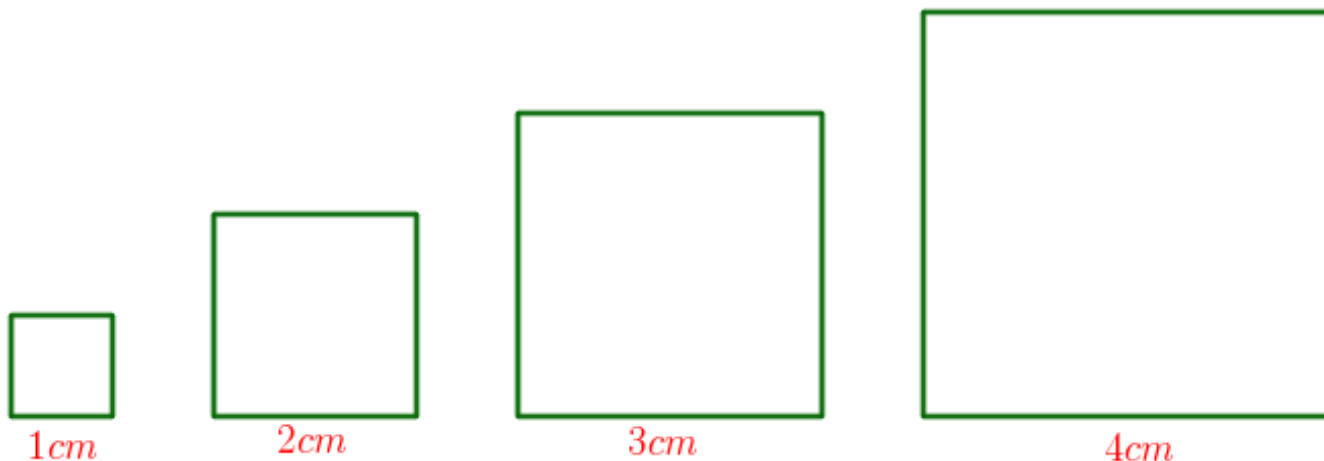


# ONLINE MATHS CLASS - X – 04 ( 24 / 06 /2021 )

## 1. ARITHMETIC SEQUENCE - CLASS 2

### WORKSHEET - ANSWERS

1.



In the above sequence of squares , the length of the sides go 1cm , 2 cm , 3 cm , 4cm , .....

Based on this , complete the table given below .

	Number sequence	Algebraic form
Sequence of perimeter		
Sequence of area		
Sequence of the length of the diagonal		

### Answer

Perimeter of a square = 4 x side

Position of the term	1	2	3	4	5	...	$n$
Term	$4 \times 1$ $= 4$	$4 \times 2$ $= 8$	$4 \times 3$ $= 12$	$4 \times 4$ $= 16$	$4 \times 5$ $= 20$	...	$4 \times n$ $= 4n$

Area of the square = side x side

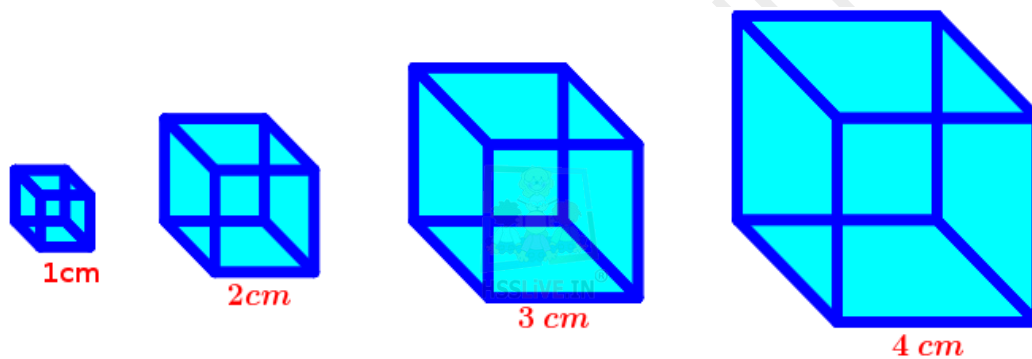
Position of the term	1	2	3	4	5	...	$n$
Term	$1 \times 1$ $= 1$	$2 \times 2$ $= 4$	$3 \times 3$ $= 9$	$4 \times 4$ $= 16$	$5 \times 5$ $= 25$	...	$n \times n$ $= n^2$

**Length of the diagonal of the square** =  $\sqrt{2} \times \text{side}$

Position of the term	1	2	3	4	5	...	$n$
Term	$\sqrt{2} \times 1$ $= \sqrt{2}$	$\sqrt{2} \times 2$ $= 2\sqrt{2}$	$\sqrt{2} \times 3$ $= 3\sqrt{2}$	$\sqrt{2} \times 4$ $= 4\sqrt{2}$	$\sqrt{2} \times 5$ $= 5\sqrt{2}$	...	$\sqrt{2} \times n$ $= n\sqrt{2}$

	Number sequence	Algebraic form
Sequence of perimeter	4, 8, 12, ...	$4n$
Sequence of area	1, 4, 9, ...	$n^2$
Sequence of the length of the diagonal	$\sqrt{2}$ , $2\sqrt{2}$ , $3\sqrt{2}$ , ...	$n\sqrt{2}$

2.



In the above sequence of cubes, the length of the edges go 1cm, 2 cm, 3 cm, 4cm, .....

- Write the sequence of volume of the cubes.
- Write the algebraic form of the sequence of volume of the cubes.

**Answer**

**Volume of a cube** = side x side x side

Position of the term	1	2	3	4	5	...	$n$
Term	$1 \times 1 \times 1$ $= 1$	$2 \times 2 \times 2$ $= 8$	$3 \times 3 \times 3$ $= 27$	$4 \times 4 \times 4$ $= 64$	$5 \times 5 \times 5$ $= 125$	...	$n \times n \times n$ $= n^3$

a) 1, 8, 27, ...

b)  $n^3$

3. Complete the table given below .

	Number sequence	Algebraic form
<b>Multiples of 4</b>		
<b>3 less than multiples of 4</b>		
<b>natural numbers which leave a remainder 1 on division by 4.</b>		

**Answer**

**Multiples of 4**

<b>Position of the term</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>...</b>	<b><math>n</math></b>
<b>Term</b>	$4 \times 1$ $= 4$	$4 \times 2$ $= 8$	$4 \times 3$ $= 12$	$4 \times 4$ $= 16$	$4 \times 5$ $= 20$	$...$	$4 \times n$ $= 4n$

**3 less than multiples of 4**

<b>Position of the term</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>...</b>	<b><math>n</math></b>
<b>Term</b>	$4 \times 1 - 3$ $= 4 - 3$ $= 1$	$4 \times 2 - 3$ $= 8 - 3$ $= 5$	$4 \times 3 - 3$ $= 12 - 3$ $= 9$	$4 \times 4 - 3$ $= 16 - 3$ $= 13$	$4 \times 5 - 3$ $= 20 - 3$ $= 17$	$...$	$4 \times n - 3$ $= 4n - 3$

**Natural numbers which leave a remainder 1 on division by 4.**

<b>Position of the term</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>...</b>	<b><math>n</math></b>
<b>Term</b>	$1$ $= 4 - 3$ $= 4 \times 1 - 3$	$5$ $= 8 - 3$ $= 4 \times 2 - 3$	$9$ $= 12 - 3$ $= 4 \times 3 - 3$	$13$ $= 16 - 3$ $= 4 \times 4 - 3$	$17$ $= 20 - 3$ $= 4 \times 5 - 3$	$...$	$4 \times n - 3$ $= 4n - 3$

	Number sequence	Algebraic form
<b>Multiples of 4</b>	<b>4, 8, 12, . . .</b>	<b><math>4n</math></b>
<b>3 less than multiples of 4</b>	<b>1, 5, 9, . . .</b>	<b><math>4n - 3</math></b>
<b>natural numbers which leave a remainder 1 on division by 4.</b>	<b>1, 5, 9, . . .</b>	<b><math>4n - 3</math></b>

4. Complete the table given below .

	Number sequence	Algebraic form
<b>Multiples of 5</b>		
<b>2 less than multiples of 5</b>		
<b>natural numbers ending in 3 or 8 .</b>		
<b>natural numbers which leave a remainder 3 on division by 5.</b>		

**Answer**

**Multiples of 5**

<b>Position of the term</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>. . .</b>	<b><math>n</math></b>
<b>Term</b>	<b><math>5 \times 1</math> <math>= 5</math></b>	<b><math>5 \times 2</math> <math>= 10</math></b>	<b><math>5 \times 3</math> <math>= 15</math></b>	<b><math>5 \times 4</math> <math>= 20</math></b>	<b><math>5 \times 5</math> <math>= 25</math></b>	<b>. . .</b>	<b><math>5 \times n</math> <math>= 5n</math></b>

**2 less than multiples of 5**

<b>Position of the term</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>. . .</b>	<b><math>n</math></b>
<b>Term</b>	<b><math>5 \times 1 - 2</math> <math>= 5 - 2</math> <math>= 3</math></b>	<b><math>5 \times 2 - 2</math> <math>= 10 - 2</math> <math>= 8</math></b>	<b><math>5 \times 3 - 2</math> <math>= 15 - 2</math> <math>= 13</math></b>	<b><math>5 \times 4 - 2</math> <math>= 20 - 2</math> <math>= 18</math></b>	<b><math>5 \times 5 - 2</math> <math>= 25 - 2</math> <math>= 23</math></b>	<b>. . .</b>	<b><math>5 \times n - 2</math>  <math>= 5n - 2</math></b>

Natural numbers ending in 3 or 8 .

Position of the term	1	2	3	4	5	...	$n$
Term	3	8	13	18	23	...	
	$= 5 - 2$	$= 10 - 2$	$= 15 - 2$	$= 20 - 2$	$= 25 - 2$	...	$5 \times n - 2$
	$= 5 \times 1 - 2$	$= 5 \times 2 - 2$	$= 5 \times 3 - 2$	$= 5 \times 4 - 2$	$= 5 \times 5 - 2$		$= 5n - 2$

Natural numbers which leave a remainder 3 on division by 5.

Position of the term	1	2	3	4	5	...	$n$
Term	3	8	13	18	23	...	
	$= 5 - 2$	$= 10 - 2$	$= 15 - 2$	$= 20 - 2$	$= 25 - 2$	...	$5 \times n - 2$
	$= 5 \times 1 - 2$	$= 5 \times 2 - 2$	$= 5 \times 3 - 2$	$= 5 \times 4 - 2$	$= 5 \times 5 - 2$		$= 5n - 2$

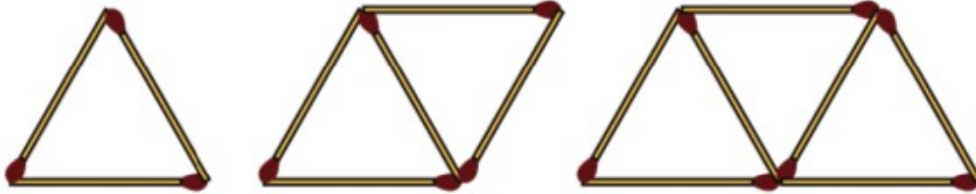
	Number sequence	Algebraic form
<b>Multiples of 5</b>	5, 10, 15, ...	$5n$
<b>2 less than multiples of 5</b>	3, 8, 13, ...	$5n - 2$
<b>natural numbers ending in 3 or 8 .</b>	3, 8, 13, ...	$5n - 2$
<b>natural numbers which leave a remainder 3 on division by 5.</b>	3, 8, 13, ...	$5n - 2$

# ONLINE MATHS CLASS - X - 05 ( 28 / 06 /2021 )

## 1. ARITHMETIC SEQUENCE - CLASS 3

### WORKSHEET - ANSWERS

1. Let's make figures using matchsticks as shown in the figure.



- If we continue like this , how many matchsticks will be there in the fourth figure ?
- If we continue this process , write the sequence of number of matchsticks in each figure ?
- Is this sequence an arithmetic sequence ? Give reasons .

#### Answer

a ) 9

b ) 3 , 5 , 7 , 9 , . . .

c ) Here the sequence start with 3 and adding 2 repeatedly . So it is an arithmetic sequence .

2. Consider sequence of circles with radii 1 cm , 2 cm, 3cm , 4 cm , . . . ( radii change in order )

- Write the sequence of perimeters of the circles .
- Is this sequence an arithmetic sequence ? Give reasons .

#### Answer

a ) Perimeter of the circle =  $2\pi \times \text{radius}$

$$2\pi \times 1 , 2\pi \times 2 , 2\pi \times 3 , . . . = 2\pi , 4\pi , 6\pi , . . .$$

b ) Here the sequence start with  $2\pi$  and adding  $2\pi$  repeatedly . So it is an arithmetic sequence .



3. a) Write the sequence of natural numbers which leave remainder 1 on division by 2
- b) Is this sequence an arithmetic sequence ? Give reasons .

**Answer**

a) 1, 3, 5, . . .

b) Here the sequence start with 1 and adding 2 repeatedly . So it is an arithmetic sequence .

4. a) Write the sequence got by multiplying natural numbers by 5 and then add 3 .
- b) Is this sequence an arithmetic sequence ? Give reasons .

**Answer**

a)  $5 \times 1 + 3$  ,  $5 \times 2 + 3$  ,  $5 \times 3 + 3$  ,  $5 \times 4 + 3$  , . . .

$= 5 + 3$  ,  $10 + 3$  ,  $15 + 3$  ,  $20 + 3$  , . . .

$= 8$  , 13 , 18 , 23 , . . .

b) Here the sequence start with 8 and adding 5 repeatedly . So it is an arithmetic sequence .

5. a) Write the sequence got by multiplying natural numbers by 7 and then subtract 4 .
- b) Is this sequence an arithmetic sequence ? Give reasons .

**Answer**

a)  $7 \times 1 - 4$  ,  $7 \times 2 - 4$  ,  $7 \times 3 - 4$  ,  $7 \times 4 - 4$  , . . .

$= 7 - 4$  ,  $14 - 4$  ,  $21 - 4$  ,  $28 - 4$  , . . .

$= 3$  , 10 , 17 , 24 , . . .

b) Here the sequence start with 3 and adding 7 repeatedly . So it is an arithmetic sequence .

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

### 1. ARITHMETIC SEQUENCE -CLASS 5 -WORK SHEET - ANSWER

1. Consider the sequence of two digit numbers which leave a remainder 1 on division by 5

- Write down the sequence .
- What is the common difference of the sequence ?
- Which is the smallest number in this sequence ?
- Which is the largest number in this sequence ?
- How many terms are there in this sequence ?

#### Answer

a) 11 , 16 , 21 , . . .

b) Common difference = 5

c) Smallest number = 11

d) Largest number = 96

e) 
$$\text{Position difference} = \frac{\text{Term difference}}{\text{Common difference}} = \frac{96-11}{5} = \frac{85}{5} = 17$$

$$\text{Number of terms} = 17 + 1 = 18$$

2. Consider the sequence of three digit numbers which leave a remainder 3 on division by 10 .

- Write down the sequence .
- What is the common difference of the sequence ?
- Which is the smallest number in this sequence ?
- Which is the largest number in this sequence ?
- How many terms are there in this sequence ?

**Answer**

a) 103 , 113 , 123 , . . .

b) Common difference = 10

c) Smallest number = 103


d) Largest number = 993

$$e) \text{ Position difference} = \frac{\text{Term difference}}{\text{Common difference}} = \frac{993-103}{10} = \frac{890}{10} = 89$$

$$\text{Number of terms} = 89 + 1 = 90$$

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

a)

3		9
	HSSLIVE.IN®	
15		57

b)

4			13
22			85

c)

5			17
29			113

Answer

a)

3	5	7	9
7	13	19	25
11	21	31	41
15	29	43	57

b)

4	7	10	13
10	19	28	37
16	31	46	61
22	43	64	85

c)

5	9	13	17
13	25	37	49
21	41	61	81
29	57	85	113

# ONLINE MATHS CLASS - X - 08 ( 05 / 07 /2021 )

## 1.ARITHMETIC SEQUENCE- CLASS 6 – WORK SHEET -ANSWER

1. Complete the following table .

	Arithmetic sequence	Common difference	Algebraic form
Multiples of 7			
Add 3 to the multiples of 7			
Subtract 2 from the multiples of 7			

Answer

	Arithmetic sequence	Common difference	Algebraic form
Multiples of 7	7, 14, 21, ...	7	7 n
Add 3 to the multiples of 7	10, 17, 24, ...	7	7 n + 3
Subtract 2 from the multiples of 7	5, 12, 19, ...	7	7 n - 2

2. Complete the following table .

Arithmetic sequence	Common difference	Algebraic form
6, 12, 18, . . . .		
10, 16, 22, . . . .		
1, 7, 13, . . . .		

Answer

Arithmetic sequence	Common difference	Algebraic form
6, 12, 18, . . . .	6	6 n

<b>10 , 16 , 22 , . . .</b>	<b>6</b>	<b>6 n + 4</b>
<b>1 , 7 , 13 , . . .</b>	<b>6</b>	<b>6 n - 5</b>

**3. Consider the sequence of natural numbers which leave a remainder 1 on division by 9 .**

- Write down the sequence ?
- What is the common difference of this sequence ?
- What is the algebraic form of this sequence ?

**Answer**

a) 1 , 10 , 19 , . . .

b) Common difference = 9

c) Algebraic form =  $d n + f - d$   $f = 1$   
 $= 9 \times n + 1 - 9$   $d = 9$   
 $= 9 n - 8$

**4. Fifth term of an arithmetic sequence is 16 and its ninth term is 28 .**

- What is the common difference of this sequence ?
- What is the first term of this sequence ?
- What is the algebraic form of this sequence ?

**Answer**

a) Common difference =  $\frac{\text{Term difference}}{\text{Position difference}} = \frac{x_9 - x_5}{9 - 5} = \frac{28 - 16}{4} = \frac{12}{4} = 3$

b) First term = Fifth term - 4 x Common difference

$$= 16 - (4 \times 3) = 16 - 12 = 4$$

c) Algebraic form =  $d n + f - d$   $f = 4$   
 $= 3 \times n + 4 - 3$   $d = 3$   
 $= 3 n + 1$

## ONLINE MATHS CLASS - X - 09 ( 08 / 07 /2021 )

### 1.ARITHMETIC SEQUENCE - CLASS 7 - WORK SHEET - ANSWER

1. The algebraic form of a sequence is  $3n + 2$  .

a) Write down the sequence .

b) Check whether this sequence is an arithmetic sequence .

#### Answer

a)  $x_n = 3n + 2$

$$x_1 = 3 \times 1 + 2 = 3 + 2 = 5$$

$$x_2 = 3 \times 2 + 2 = 6 + 2 = 8$$

$$x_3 = 3 \times 3 + 2 = 9 + 2 = 11$$

$$x_4 = 3 \times 4 + 2 = 12 + 2 = 14$$

$$x_5 = 3 \times 5 + 2 = 15 + 2 = 17$$

$$\text{Sequence} = 5, 8, 11, 14, 17, \dots$$

b) Here the sequence start with 5 and adding 3 repeatedly . So it is an arithmetic sequence .

2. The algebraic form of of a sequence is is  $6n - 1$  .

a) Write down the sequence .

b) Check whether this sequence is an arithmetic sequence .

#### Answer

a)  $x_n = 6n - 1$

$$x_1 = 6 \times 1 - 1 = 6 - 1 = 5$$

$$x_2 = 6 \times 2 - 1 = 12 - 1 = 11$$

$$x_3 = 6 \times 3 - 1 = 18 - 1 = 17$$

$$x_4 = 6 \times 4 - 1 = 24 - 1 = 23$$

$$x_5 = 6 \times 5 - 1 = 30 - 1 = 29$$

Sequence = 5, 11, 17, 23, 29, . . .

b) Here the sequence start with 5 and adding 6 repeatedly . So it is an arithmetic sequence .

3. 10<sup>th</sup> term of an arithmetic sequence is 20 and its 20<sup>th</sup> term is 10 .

- What is its common difference ?
- What is its first term ?
- What is its algebraic form ?
- What is its 30<sup>th</sup> term ?
- What is the product of first 50 terms of this sequence ?

**Answer**

$$\text{a) Common difference} = \frac{\text{Term difference}}{\text{Position difference}} = \frac{x_{20} - x_{10}}{20 - 10} = \frac{10 - 20}{10} = \frac{-10}{10} = -1$$

First term = 10<sup>th</sup> term - 9 x common difference

$$= 20 - 9 \times -1 = 20 + 9 = 29$$

$\begin{aligned} \text{c) } x_n &= d n + f - d \\ &= -1 \times n + 29 - (-1) \\ &= -n + 29 + 1 \\ &= -n + 30 \end{aligned}$	$\begin{aligned} f &= 29 \\ d &= -1 \end{aligned}$
---	--

$$\text{d) } x_{30} = -30 + 30 = 0$$

e) Product of first 50 terms of this sequence = 0



4. Consider the arithmetic sequence 5, 9, 13, . . .

a) What is its common difference ?

b) What is its algebraic form ?

c) Prove that the squares of all the terms of this sequence belong to it .

**Answer**

a)  $d = 9 - 5 = 4$

b) 
$$\begin{aligned} x_n &= d n + f - d \\ &= 4 \times n + 5 - 4 \\ &= 4 n + 1 \end{aligned}$$

c) 
$$\begin{aligned} (x_n)^2 &= (4 n + 1)^2 & [ (a+b)^2 = a^2 + b^2 + 2ab ] \\ &= (4 n)^2 + 1^2 + 2 \times 4n \times 1 \\ &= 16 n^2 + 1 + 8 n \\ &= 16 n^2 + 8 n + 1 \\ &= 4 \times 4 n^2 + 4 \times 2 n + 1 \\ &= 4 (4 n^2 + 2 n) + 1 \end{aligned}$$

That is , the square of any term of this sequence is got by adding 1 to a multiple of 4 .

The terms of this sequence are also got by adding 1 to the multiples of 4. ( $x_n = 4 n + 1$ )

So the squares of all the terms of this sequence belong to it .

**NOTE : ( Another method )**

$$\begin{aligned} (x_n)^2 &= 16 n^2 + 8 n + 1 \\ (x_n)^2 - 5 &= 16 n^2 + 8 n + 1 - 5 \\ &= 16 n^2 + 8 n - 4 \\ &= 4 \times 4 n^2 + 4 \times 2 n - 4 \times 1 \\ &= 4 (4 n^2 + 2 n - 1) \end{aligned}$$

Here the difference between  $(x_n)^2$  and 5 is divisible by the common difference .

(Difference is the multiple of the common difference ) .So  $(x_n)^2$  is a term of this sequence

That is , the squares of all the terms of this sequence belong to it .

5. Consider the arithmetic sequence 9 , 16 , 23 , . . .

a) What is its common difference ?

b) What is its algebraic form ?

c) Prove that the square of any term of this sequence does not belong to it .

**Answer**

a)  $d = 16 - 9 = 7$

b) 
$$\begin{aligned} x_n &= d n + f - d \\ &= 7 \times n + 9 - 7 \\ &= 7 n + 2 \end{aligned}$$

c) 
$$\begin{aligned} (x_n)^2 &= (7 n + 2)^2 & [ (a+b)^2 = a^2 + b^2 + 2ab ] \\ &= (7 n)^2 + 2^2 + 2 \times 7n \times 2 \\ &= 49 n^2 + 4 + 28 n \\ &= 49 n^2 + 28 n + 4 \\ &= 7 \times 7 n^2 + 7 \times 4 n + 4 \\ &= 7(7 n^2 + 4 n) + 4 \end{aligned}$$

That is , the square of any term of this sequence is got by adding 4 to a multiple of 7 .

But the terms of this sequence are got by adding 2 to the multiples of 7.  $(x_n = 7 n + 2)$

So the square of any term of this sequence does not belong to it .

**NOTE : ( Another method )**

$$(x_n)^2 = 49 n^2 + 28 n + 4$$

$$(x_n)^2 - 9 = 49 n^2 + 28 n + 4 - 9$$

$$= 49 n^2 + 28 n - 5$$

$$= 7 \times 7 n^2 + 7 \times 4 n - 5$$

$$= 7 (7 n^2 + 4 n) - 5$$

**Here the difference between  $(x_n)^2$  and 9 is not divisible by the common difference .**

**( Difference is not a multiple of the common difference ) . So  $(x_n)^2$  is not a term of this sequence . That is , the square of any term of this sequence does not belong to it .**



# ONLINE MATHS CLASS - X - 06 ( 29 / 06 /2021 )

## 1. ARITHMETIC SEQUENCE - CLASS 4

### WORKSHEET - ANSWERS

1. Fill in the blanks ..

- a ) By adding      times the common difference to the first term of an arithmetic sequence , we get the 12<sup>th</sup> term .
- b) By adding      times the common difference to the first term of an arithmetic sequence , we get the 20<sup>th</sup> term .
- c) By adding      times the common difference to the fifth term of an arithmetic sequence , we get the 13<sup>th</sup> term .
- d) By adding      times the common difference to the eighth term of an arithmetic sequence , we get the 30<sup>th</sup> term .
- e) By subtracting      times the common difference from the 10<sup>th</sup> term of an arithmetic sequence , we get the fourth term .
- f) By subtracting      times the common difference from the 19<sup>th</sup> term of an arithmetic sequence , we get the third term .

### Answer

- a ) By adding 11 times the common difference to the first term of an arithmetic sequence , we get the 12<sup>th</sup> term .
- b) By adding 19 times the common difference to the first term of an arithmetic sequence , we get the 20<sup>th</sup> term .
- c) By adding 8 times the common difference to the fifth term of an arithmetic sequence , we get the 13<sup>th</sup> term .

- d) By adding 22 times the common difference to the eighth term of an arithmetic sequence , we get the 30<sup>th</sup> term .
- e) By subtracting 6 times the common difference from the 10<sup>th</sup> term of an arithmetic sequence , we get the fourth term .
- f) By subtracting 16 times the common difference from the 19<sup>th</sup> term of an arithmetic sequence , we get the third term .

2. First two terms of some arithmetic sequences are given in the table . Complete the table

$x_1$	$x_2$	Common difference	$x_5$	$x_{10}$	$x_{20}$
5	8				
2	6				
7	12				
10	20				
20	40				

**Answer**

$x_1$	$x_2$	Common difference	$x_5$	$x_{10}$	$x_{20}$
5	8	$8 - 5 = 3$	$5 + 4 \times 3$ $= 5 + 12$ $= 17$	$5 + 9 \times 3$ $= 5 + 27$ $= 32$	$5 + 19 \times 3$ $= 5 + 57$ $= 62$
2	6	$6 - 2 = 4$	$2 + 4 \times 4$ $= 2 + 16$ $= 18$	$2 + 9 \times 4$ $= 2 + 36$ $= 38$	$2 + 19 \times 4$ $= 2 + 76$ $= 78$
7	12	$12 - 7 = 5$	$7 + 4 \times 5$ $= 7 + 20$ $= 27$	$7 + 9 \times 5$ $= 7 + 45$ $= 52$	$7 + 19 \times 5$ $= 7 + 95$ $= 102$

<b>10</b>	<b>20</b>	<b><math>20 - 10 = 10</math></b>	$10 + 4 \times 10$ $= 10 + 40$ $= 50$	$10 + 9 \times 10$ $= 10 + 90$ $= 100$	$10 + 19 \times 10$ $= 10 + 190$ $= 200$
<b>20</b>	<b>40</b>	<b><math>40 - 20 = 20</math></b>	$20 + 4 \times 20$ $= 20 + 80$ $= 100$	$20 + 9 \times 20$ $= 20 + 180$ $= 200$	$20 + 19 \times 20$ $= 20 + 380$ $= 400$

3. Two terms of some arithmetic sequences are given in the table . Complete the table

Terms		Term difference	Position difference	Common difference
$x_3 = 7$	$x_8 = 17$	$17 - 7 = 10$	$8 - 3 = 5$	$\frac{17-7}{8-3} = \frac{10}{5} = 2$
$x_7 = 23$	$x_{10} = 32$			
$x_6 = 27$	$x_{12} = 51$			
$x_{10} = 49$	$x_{20} = 99$			
$x_{11} = 73$	$x_{31} = 213$			
$x_{10} = 5$	$x_5 = 10$			

**Answer**

Terms		Term difference	Position difference	Common difference
$x_3 = 7$	$x_8 = 17$	$17 - 7 = 10$	$8 - 3 = 5$	$\frac{17-7}{8-3} = \frac{10}{5} = 2$

$x_7 = 23$	$x_{10} = 32$	$32 - 23 = 9$	$10 - 7 = 3$	$\frac{32-23}{10-7} = \frac{9}{3} = 3$
$x_6 = 27$	$x_{12} = 51$	$51 - 27 = 24$	$12 - 6 = 6$	$\frac{51-27}{12-6} = \frac{24}{6} = 4$
$x_{10} = 49$	$x_{20} = 99$	$99 - 49 = 50$	$20 - 10 = 10$	$\frac{99-49}{20-10} = \frac{50}{10} = 5$
$x_{11} = 73$	$x_{31} = 213$	$213 - 73 = 140$	$31 - 11 = 20$	$\frac{213-73}{31-11} = \frac{140}{20} = 7$
$x_5 = 10$	$x_{10} = 5$	$5 - 10 = -5$	$10 - 5 = 5$	$\frac{5-10}{10-5} = \frac{-5}{5} = -1$



# ONLINE MATHS CLASS - x - 10 ( 12 / 07 /2021 )

## 1. ARITHMETIC SEQUENCE CLASS 8 – WORK SHEET-ANSWER

### Important points .

- If the first term of an arithmetic sequence is  $f$  and its common difference is  $d$  ,  
then its  $n^{\text{th}}$  term is  $d n + f - d$  .
- If  $n$  is an odd number , then the sum of  $n$  consecutive terms of an arithmetic sequence =  $n \times \text{middle term}$  .

1 . Consecutive terms of some arithmetic sequences are given in the table below . Complete the table .

Terms	Number of terms	Position of the middle term	Middle term	Sum of the terms
2 , 5 , 8	3	2	5	$3 \times 5 = 15$
5 , 9 , 13 , 17 , 21				
3 , 8 , 13 , 18 , 23 , 28 , 33				
4 , 10 , 16 , 22 , 28 , 34 , 40 , 46 , 52				
10 , 15 , 20 , 25 , 30 , 35 , 40 , 45 , 50 , 55 , 60				

### Answer

Terms	Number of terms	Position of the middle term	Middle term	Sum of the terms
2 , 5 , 8	3	2	5	$3 \times 5 = 15$



5, 9, <b>13</b> , 17, 21	5	3	13	$5 \times 13 = 65$
3, 8, 13, <b>18</b> , 23, 28, 33	7	4	18	$7 \times 18 = 126$
4, 10, 16, 22, <b>28</b> , 34, 40, 46, 52	9	5	28	$9 \times 28 = 252$
10, 15, 20, 25, 30, <b>35</b> , 40, 45, 50, 55, 60	11	6	35	$11 \times 35 = 385$

2. Consider the arithmetic sequence 5, 8, 11, . . .

- What is its common difference ?
- What is its 6<sup>th</sup> term ?
- Find the sum of first 11 terms of this sequence .

**Answer**

a) Common difference =  $8 - 5 = 3$

b) 6<sup>th</sup> term =  $x_1 + 5d = 5 + (5 \times 3) = 5 + 15 = 20$

c) Sum of first 11 terms =  $11 \times \text{Middle term} = 11 \times 6^{\text{th}} \text{ term} = 11 \times 20 = 220$

3. Consider the arithmetic sequence 7, 12, 17, . . .

- What is its common difference ?
- What is its 10<sup>th</sup> term ?
- Find the sum of first 19 terms of this sequence .

**Answer**

a) Common difference =  $12 - 7 = 5$

b) 10<sup>th</sup> term =  $x_1 + 9d = 7 + (9 \times 5) = 7 + 45 = 52$

c) Sum of first 19 terms =  $19 \times \text{Middle term} = 19 \times 10^{\text{th}} \text{ term} = 19 \times 52 = 988$

4. The sum of first 9 terms of an arithmetic sequence is 189 and its common difference is 4

- What is its fifth term ?

- b) What is its first term ?
- c) Find the algebraic form of this sequence .

**Answer**

a) Sum of first 9 terms = 9 x Middle term = 9 x 5<sup>th</sup> term

$$9 \times 5^{\text{th}} \text{ term} = 189$$

$$5^{\text{th}} \text{ term} = \frac{189}{9} = 21$$

b) First term =  $x_5 - 4d = 21 - (4 \times 4) = 21 - 16 = 5$

c) 
$$\begin{aligned} x_n &= dn + f - d \\ &= 4n + 5 - 4 \\ &= 4n + 1 \end{aligned}$$

5. The sum of first 7 terms of an arithmetic sequence is 63 and its fifth term is 11 .

- a) What is its fourth term ?
- b) What is its common difference ?
- c) What is its eighth term ?

**Answer**

a) Sum of first 7 terms = 7 x Middle term = 7 x 4<sup>th</sup> term

$$7 \times 4^{\text{th}} \text{ term} = 63$$

$$4^{\text{th}} \text{ term} = \frac{63}{7} = 9$$

b) Common difference =  $x_5 - x_4 = 11 - 9 = 2$

c) 
$$\begin{aligned} x_8 &= x_4 + 4d \\ &= 9 + (4 \times 2) \\ &= 9 + 8 = 17 \end{aligned}$$

6. The sum of first 3 terms of an arithmetic sequence is 39 and the sum of first 5 terms is 95 .

- What is its second term ?
- What is its third term ?
- What is its common difference ?
- Find the algebraic form of this sequence .

**Answer**

a) Sum of first 3 terms = 3 x Middle term = 3 x second term

$$3 \times \text{second term} = 39$$

$$\text{second term} = \frac{39}{3} = 13$$

b) Sum of first 5 terms = 5 x Middle term = 5 x third term

$$5 \times \text{third term} = 95$$

$$\text{third term} = \frac{95}{5} = 19$$

c) Common difference =  $19 - 13 = 6$

$$\begin{aligned} \text{d)} \quad x_n &= d n + f - d \\ &= 6 n + 13 - 6 \\ &= 6 n + 7 \end{aligned}$$

$$\begin{aligned} f &= x_2 - d \\ &= 19 - 6 = 13 \end{aligned}$$

# ONLINE MATHS CLASS - X - 10 ( 12 / 07 /2021 )

## 1.ARITHMETIC SEQUENCE-CLASS 8–WORK SHEET- 2 ANSWER

### Important points .

- $\text{Common difference} = \frac{\text{Term difference}}{\text{Position difference}}$
- If the first term of an arithmetic sequence is  $f$  and its common difference is  $d$  ,  
then its  $n^{\text{th}}$  term is  $d n + f - d$  .
- If  $n$  is an odd number , then the sum of  $n$  consecutive terms of an arithmetic sequence =  $n \times \text{middle term}$  .
- In an arithmetic sequence , if the sums of positions of two pairs of terms are equal , then the sums of the pairs of the terms are equal .

1) The sum of first and 9<sup>th</sup> terms of an arithmetic sequence is 44 .

- a) What is the sum of second and 8<sup>th</sup> terms of this sequence ?
- b) If the fourth term is 18 , find its 6<sup>th</sup> term .
- c) What is its fifth term ?

### Answer

$$x_1 + x_9 = 44$$

a)  $x_2 + x_8 = 44$

b)  $x_4 + x_6 = 44 \implies 18 + x_6 = 44$

$$x_6 = 44 - 18 = 26$$

c)  $x_5 = \frac{x_1 + x_9}{2} = \frac{44}{2} = 22$

2) Seventh term of an arithmetic sequence is 36 .

a) What is the sum of first and 13<sup>th</sup> terms of this sequence ?

b) What is the sum of 6<sup>th</sup> and 8<sup>th</sup> terms of this sequence ?

c) If the 5<sup>th</sup> term is 26 , find its 9<sup>th</sup> term .

**Answer**

a)  $x_1 + x_{13} = 2 \times x_7 = 2 \times 36 = 72$

b)  $x_6 + x_8 = 72$

c)  $x_5 + x_9 = 72 \implies 26 + x_9 = 72$

$$x_9 = 72 - 26 = 46$$

3) The sum of first and 10<sup>th</sup> terms of an arithmetic sequence is 35 and its third term is 10

a) What is the sum of second and 9<sup>th</sup> terms of this sequence ?

b) What is its 8<sup>th</sup> term ?

c) What is its common difference ?

d) What is its algebraic form ?

**Answer**

$$x_1 + x_{10} = 35$$

a)  $x_2 + x_9 = 35$

b)  $x_3 + x_8 = 35 \implies 10 + x_8 = 35$

$$x_8 = 35 - 10 = 25$$

c)  $\text{Common difference} = \frac{\text{Term difference}}{\text{Position difference}} = \frac{x_8 - x_3}{8 - 3} = \frac{25 - 10}{5} = \frac{15}{5} = 3$

d)  $x_1 = x_3 - 2d = 10 - (2 \times 3) = 10 - 6 = 4$

$$x_n = dn + f - d = 3 \times n + 4 - 3 = 3n + 1$$

4) The sum of the first and 12<sup>th</sup> terms of an arithmetic sequence is 68 .

- a) What is the sum of its second and 11<sup>th</sup> terms ?
- b) What is the sum of its third and 10<sup>th</sup> terms ?
- c) What is the sum of its 6<sup>th</sup> and 7<sup>th</sup> terms ?
- d) What is the sum of first 12 terms of this sequence ?

**Answer**

$$x_1 + x_{12} = 68$$

a)  $x_2 + x_{11} = 68$

b)  $x_3 + x_{10} = 68$

c)  $x_6 + x_7 = 68$

d) Sum of first 12 terms =  $6 \times 68 = 408$  ( Total 6 pairs )

$$( x_1 + x_{12} = x_2 + x_{11} = x_3 + x_{10} = x_4 + x_9 = x_5 + x_8 = x_6 + x_7 )$$

5) The sum of the third and 18<sup>th</sup> terms of an arithmetic sequence is 40 .

- a) What is the sum of its first and 20<sup>th</sup> terms ?
- b) What is the sum of its second and 19<sup>th</sup> terms ?
- c) What is the sum of its 10<sup>th</sup> and 11<sup>th</sup> terms ?
- d) What is the sum of first 20 terms of this sequence ?

**Answer**

$$x_3 + x_{18} = 40$$

a)  $x_1 + x_{20} = 40$

b)  $x_2 + x_{19} = 40$

c)  $x_{10} + x_{11} = 40$

d) Sum of first 20 terms =  $10 \times 40 = 400$  ( Total 10 pairs )

$$( x_1 + x_{20} = x_2 + x_{19} = x_3 + x_{18} = \dots = x_9 + x_{12} = x_{10} + x_{11} )$$

# ONLINE MATHS CLASS - X - 11 ( 14 / 07 /2021 )

## 1. ARITHMETIC SEQUENCE - CLASS 9 – WORK SHEET-ANSWER

### Important points .

➤ In an arithmetic sequence , the sums of the pairs of the terms are equal if the sums of their positions are equal .

➤  $1 + 2 + 3 + \dots + n = \frac{n(n+1)}{2}$

➤ For the arithmetic sequence ,  $x_n = an + b$

the sum of first  $n$  terms is  $x_1 + x_2 + x_3 + \dots + x_n = a \frac{n(n+1)}{2} + bn$

1. Compute the following sums .

a)  $1 + 2 + 3 + \dots + 40$

b)  $2 + 4 + 6 + \dots + 80$

c)  $3 + 5 + 7 + \dots + 81$

d)  $6 + 11 + 16 + \dots + 201$

### Answer

a)  $1 + 2 + 3 + \dots + 40 = \frac{40 \times 41}{2} = 820$

b)  $2 + 4 + 6 + \dots + 80 = 2( 1 + 2 + 3 + \dots + 40 ) = 2 \times 820 = 1640$

c)  $3 + 5 + 7 + \dots + 81 = 1640 + 40 \times 1 = 1640 + 40 = 1680$

( Here the terms of the arithmetic sequence  $2, 4, 6, \dots, 80$  are got by adding 1 to the terms of the arithmetic sequence  $3, 5, 7, \dots, 81$  )

d)  $6 + 11 + 16 + \dots + 201 = 820 + 1640 + 1680 = 4140$  (  $a + b + c$  )

## 2. Compute the following sums .

- a)  $1 + 2 + 3 + \dots + 50$
- b)  $6 + 12 + 18 + \dots + 300$
- c)  $1 + 7 + 13 + \dots + 295$
- d)  $7 + 19 + 31 + \dots + 595$

### Answer

$$\text{a) } 1 + 2 + 3 + \dots + 50 = \frac{50 \times 51}{2} = 1275$$

$$\text{b) } 6 + 12 + 18 + \dots + 300 = 6(1 + 2 + 3 + \dots + 50) = 6 \times 1275 = 7650$$

$$\text{c) } 1 + 7 + 13 + \dots + 295 = 7650 - 50 \times 5 = 7650 - 250 = 7400$$

( Here the terms of the arithmetic sequence  $6, 12, 18, \dots, 300$  are got by subtracting 5 from the terms of the arithmetic sequence  $3, 5, 7, \dots, 81$  )

$$\text{d) } 7 + 19 + 31 + \dots + 595 = 7650 + 7400 = 15050 \quad (b + c)$$

## 3) Consider the arithmetic sequences $9, 14, 19, \dots$ and $7, 12, 17, \dots$

- a) Find the common difference of these sequences .
- b) What is the difference between the first terms of these sequences ?
- c) Calculate the difference between the sums of the first 30 terms of these sequences .

### Answer

$$\text{a) Common difference of the first sequence} = 14 - 9 = 5$$

$$\text{Common difference of the second sequence} = 12 - 7 = 5$$

$$\text{b) } 9 - 7 = 2$$



c)

$$9 + 14 + 19 + \dots + x_{30} -$$

$$7 + 12 + 17 + \dots + y_{30}$$

---


$$2 + 2 + 2 + \dots + 2 = 2 \times 30 = 60$$

4) Consider the arithmetic sequence 5, 8, 11, . . .

- What is the common difference of the sequence ?
- What is the difference between the 21<sup>st</sup> and first terms of this sequence ?
- What is the difference between the 40<sup>th</sup> and 20<sup>th</sup> terms of this sequence ?
- What is the difference between the sum of the first 20 terms and the next 20 terms of this sequence ?

### Answer

a) Common difference =  $8 - 5 = 3$

b)  $x_{21} - x_1 = 20 \times \text{common difference} = 20 \times 3 = 60$

c)  $x_{40} - x_{20} = 20 \times \text{common difference} = 20 \times 3 = 60$

d)

$$x_{21} + x_{22} + x_{23} + \dots + x_{40} -$$

$$x_1 + x_2 + x_3 + \dots + x_{20}$$

---


$$20d + 20d + 20d + \dots + 20d = 20 \times 20d$$

$$= 20 \times 20 \times 3 = 1200$$

5. Common difference of an arithmetic sequence is 8 and the sum of the first 20 terms is 636 .

- What is the sum of the first and 12<sup>th</sup> terms of this sequence ?
- What is the common difference of this sequence ?

c) Write down the sequence .

**Answer**

$$\text{a) } x_1 + x_{12} = \frac{636}{6} = 106 \quad (12 \text{ terms} \Rightarrow \text{total } 6 \text{ pairs})$$

$$x_1 + (x_1 + 11d) = 106$$

$$2x_1 + 11d = 106$$

$$2x_1 + 11 \times 8 = 106$$

$$2x_1 + 88 = 106$$

$$2x_1 = 106 - 88 = 18 \Rightarrow x_1 = \frac{18}{2} = 9$$

**Sequence = 9 , 17, 25 , . . .**

**NOTE : ( Another method )**



**The algebraic form any arithmetic sequence of common difference 8 can be taken as**

$$8n + b$$

$$\text{Sum of first 12 terms} = 636 \Rightarrow 8 \times \frac{12 \times 13}{2} + b \times 12 = 636$$

$$8 \times 78 + 12b = 636$$

$$624 + 12b = 636$$

$$12b = 636 - 624 = 12$$

$$b = \frac{12}{12} = 1$$

$$x_n = 8n + b = 8n + 1$$

$$x_1 = 8 \times 1 + 1 = 8 + 1 = 9$$

**Sequence = 9 , 17, 25 , . . .**

# ONLINE MATHS CLASS - X - 12 ( 15 / 07 /2021 )

## 1. ARITHMETIC SEQUENCE - CLASS-10 -WORK SHEET - ANSWER

### Important points

- The sum of any number of consecutive terms of an arithmetic sequence is half the product of the number of terms and the sum of the first and last terms .

$$x_1 + x_2 + x_3 + \dots + x_n = \frac{n}{2} (x_1 + x_n)$$

- For the arithmetic sequence ,  $x_n = an + b$

the sum of the first  $n$  terms is  $x_1 + x_2 + x_3 + \dots + x_n = a \frac{n(n+1)}{2} + bn$

- The algebraic form of the sum of an arithmetic sequence is  $pn^2 + qn$

$$(p = \frac{a}{2}, p + q = f)$$

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- 1) Consider the arithmetic sequence 7 , 11 , 15 , . . .

- What is the common difference of the sequence ?
- What is the 30<sup>th</sup> term of the sequence ?
- Find the sum of the first 30 terms of the sequence .

### Answer

a)  $d = 11 - 7 = 4$

b)  $x_{30} = x_1 + 29d = 7 + 29 \times 4 = 7 + 116 = 123$

c) Sum of the first 30 terms =  $\frac{30}{2} \times (x_1 + x_{30}) = \frac{30}{2} \times (7 + 123) = \frac{30}{2} \times 130$

= 1950

2) Consider the arithmetic sequence 8 , 13 , 18 , . . .

a) What is the common difference of the sequence ?

b) Write the algebraic form of the sequence .

c) Find the sum of the first  $n$  terms of the sequence .

**Answer**

a)  $d = 13 - 8 = 5$

b)  $x_n = dn + f - d = 5n + 8 - 5 = 5n + 3$

c)

**Sum of the first  $n$  terms**  $= pn^2 + qn$

$$= \frac{5}{2}n^2 + \frac{11}{2}n$$



**OR**

$$x_n = 5n + 3$$

**Sum of the first  $n$  terms**  $= 5 \times \frac{n(n+1)}{2} + 3n = \frac{5}{2}n(n+1) + 3n$

$$= \frac{5}{2}(n^2 + n) + 3n = \frac{5}{2}n^2 + \frac{5}{2}n + 3n = \frac{5}{2}n^2 + \frac{11}{2}n$$

$$p = \frac{d}{2} = \frac{5}{2}$$

$$p + q = f$$

$$\frac{5}{2} + q = 8$$

$$q = 8 - \frac{5}{2} = \frac{16-5}{2} = \frac{11}{2}$$

3) The sum of the first  $n$  terms of an arithmetic sequence is  $4n^2 + 3n$  .

a) What is the first term of the sequence ?

b) What is the common difference of the sequence ?

c) Write the algebraic form of the sequence .

**Answer**

$$\text{a) } p + q = f \implies f = 4 + 3 = 7 \quad (p = 4, q = 3)$$

$$\text{b) } p = \frac{d}{2} \implies \frac{d}{2} = 4 \implies d = 4 \times 2 = 8$$

$$\text{c) } x_n = dn + f - d \implies = 8n + 7 - 8 = 8n - 1$$

**OR**

$$\text{Sum of the first } n \text{ terms} = 4n^2 + 3n$$

$$\text{a) First term} = 4 \times 1^2 + 3 \times 1 = 4 \times 1 + 3 = 4 + 3 = 7$$

$$\text{Sum of the first 2 terms} = 4 \times 2^2 + 3 \times 2 = 4 \times 4 + 6 = 16 + 6 = 22$$

$$\implies x_1 + x_2 = 22$$

$$7 + x_2 = 22 \implies x_2 = 22 - 7 = 15$$

$$\text{b) } d = 15 - 7 = 8$$

$$\begin{aligned} \text{c) } x_n &= dn + f - d \\ &= 8n + 7 - 8 = 8n - 1 \end{aligned}$$

4) Look at the following number pattern given below .

1  
2    3  
4    5    6  
7    8    9    10

.....

.....

a) Write the next two lines of the pattern above .

b) How many numbers are there in the 20<sup>th</sup> line ?

- c) Write the last term of the 19<sup>th</sup> line .
- d) Write the First number of the 20<sup>th</sup> line .
- e) Write the Last number of the 20<sup>th</sup> line .
- f) Find the sum of the numbers in the 20<sup>th</sup> line .

### Answer

a) 11 12 13 14 15  
16 17 18 19 20 21

b) Total numbers in the 20<sup>th</sup> line = 20

c) Last number of the 19<sup>th</sup> line =  $\frac{19 \times 20}{2} = 190$

d) First number of the 20<sup>th</sup> line =  $190 + 1 = 191$

e) Last number of the 20<sup>th</sup> line =  $\frac{20 \times 21}{2} = 210$

f) Sum of the numbers in the 20<sup>th</sup> line =  $\frac{20}{2} \times (x_1 + x_{20})$   
 $= \frac{20}{2} \times (191 + 210) = \frac{20}{2} \times 401 = 4010$

5) Look at the following number patterns given below .

1					2					3													
2	3				4	6				5	7												
4	5	6				8	10	12				9	11	13									
7	8	9	10				14	16	18	20				15	17	19	21						
11	12	13	14	15				22	24	26	28	30				23	25	27	29	31			
.....					.....					.....													
.....					.....					.....													

Pattern - 1

Pattern - 2

Pattern - 3

Complete the following table .

	Pattern - 1	Pattern - 2	Pattern - 3
Next two lines			
Number of terms in the 10 <sup>th</sup> line			
Last number of the 9 <sup>th</sup> line			
First number of the 9 <sup>th</sup> line			
Last number of the 10 <sup>th</sup> line			
Sum of the numbers in the 10 <sup>th</sup> line			

**Answer**



	Next two lines
<b>Pattern - 1</b>	16    17    18    19    20    21 22    23    24    25    26    27    28
<b>Pattern - 2</b>	32    34    36    38    40    42 44    46    48    50    52    54    56
<b>Pattern - 3</b>	33    35    37    39    41    43 45    47    49    51    53    55    57

	Pattern - 1	Pattern - 2	Pattern - 3
Number of terms in the 10 <sup>th</sup> line	10	10	10
Last number of the 9 <sup>th</sup> line	$\frac{9 \times 10}{2}$ = 45	$45 \times 2$ = 90	$90+1$ = 91
First number of the 9 <sup>th</sup> line	46	92	$92+1 = 93$
Last number of the 10 <sup>th</sup> line	$\frac{10 \times 11}{2}$ = 55	$55 \times 2$ = 110	$110+1$ = 111
Sum of the numbers in the 10 <sup>th</sup> line	$\frac{10}{2} \times (46+55)$ = $\frac{10}{2} \times 101$ = 505	$2 \times 505$ = 1010	$1010+1 \times 10$ = $1010 + 10$ = 1020

**NOTE :**

Second question contains fractions .So another question contains only natural numbers is given below .

6) Consider the arithmetic sequence 10 , 16 , 22 , . . .

a) What is the common difference of the sequence ?

b) Write the algebraic form of the sequence .

c) Find the sum of the first  $n$  terms of the sequence .

**Answer**

a)  $d = 16 - 10 = 6$



b)  $x_n = dn + f - d = 6n + 10 - 6 = 6n + 4$

c)

$$\begin{aligned}\text{Sum of the first } n \text{ terms} &= pn^2 + qn \\ &= 3n^2 + 7n\end{aligned}$$

$$p = \frac{d}{2} = \frac{6}{2} = 3$$

$$p + q = f$$

$$3 + q = 10$$

$$q = 10 - 3 = 7$$

OR

$$\begin{aligned}\text{Sum of the first } n \text{ terms} &= 6 \times \frac{n(n+1)}{2} + 4n \\ &= 3n(n+1) + 4n \\ &= 3(n^2 + n) + 4n \\ &= 3n^2 + 3n + 4n \\ &= 3n^2 + 7n\end{aligned}$$