


**Qn. 12**

**(Question Pool - 2017)**

$2x + 1, 4x - 1, 5x + 1, \dots$  are in an arithmetic sequence.

- Find  $x$ ?
- Write the algebraic expression of the sequence.
- Find the position of 195 in this sequence

 a)  $2x + 1, 4x - 1, 5x + 1, \dots$  are in arithmetic sequence.

$$2(4x - 1) = 2x + 1 + 5x + 1$$

$$8x - 2 = 7x + 2$$

$$x = 4$$

b) Sequence =  $9, 15, 21, \dots$

$$\text{Algebraic expression } x_n = 9 + (n - 1) 6$$

$$= 6n + 9 - 6 = 6n + 3$$

c)  $6n + 3 = 195$

$$6n = 192$$


$$n = \frac{192}{6} = 32$$

$32^{\text{nd}}$  term of the sequence is 195

**Qn. 13**

**(Question Pool - 2017)**

- Find the sum of first 25 counting numbers
- Find the sum of first 25 even numbers
- Find the sum of first 25 odd numbers

 a)  $1 + 2 + 3 + \dots + 25 = \frac{25 \times 26}{2}$   
 $= 25 \times 13$   
 $= 325$

b)  $2 + 4 + 6 + \dots + 50 = 2(1 + 2 + 3 + \dots + 25)$   
 $= 2 \times 325$   
 $= 650$

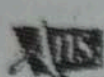
c)  $1 + 3 + 5 + \dots + 49 = (2 - 1) + (4 - 1) + (6 - 1) +$   
 $(50 - 1)$   
 $2 + 4 + 6 + \dots + 50 -$   
 $(1 + 1 + 1 + \dots + 1)$   
 $= 2(1 + 2 + 3 + \dots + 25) - (1 \times 25)$   
 $= 650 - 25$   
 $= 625$

**Qn. 14**

**(Question Pool - 2017)**

Let the algebraic expression of an arithmetic sequence be  $6n + 3$ .

- Find the sum of first 20 terms of the sequence.
- Write the algebraic expression of the sum.

 a)  $x_n = 6n + 3$

$$x_1 = 9$$

$$x_{20} = 6 \times 20 + 3 = 123$$

$$\text{Sum of first 20 terms} = \frac{20}{2} [9 + 123]$$

$$= 10 \times 132$$

$$= 1320$$

b) Sum of n terms  $= \frac{6n(n+1)}{2} + 3n$

$$= 3n^2 + 3n + 3n$$


$$= 3n^2 + 6n$$

**Qn. 15**

(Question Pool - 2017)

Consider an arithmetic sequence whose sum of first 9 terms is 261 and sum of next 6 terms is 444.

- Find the first term and common difference
- Write the algebraic expression of the sequence
- Write the algebraic expression of the sum of the sequence

 a) Sum of first 9 terms = 216

$$\text{Middle term} = 5^{\text{th}} \text{ term} = x_5 = \frac{261}{9} = 29$$

$$\text{Sum of first 15 terms} = 261 + 444 = 705$$

$$\text{Middle term} = 8^{\text{th}} \text{ term} = x_8 = \frac{705}{15} = 47$$

$$x_5 + 3d = x_8$$

$$\begin{aligned} 3d &= x_8 - x_5 \\ &= 47 - 29 = 18 \end{aligned}$$

$$d = 6$$

$$\begin{aligned} x_1 &= x_5 - 4d \\ &= 29 - 24 = 5 \end{aligned}$$


b) Algebraic expression  $x_n = 5 + (n-1)6$   
 $= 6n - 1$

c) Algebraic expression  
of the sum  $= 3n^2 + 2n$

Qn. 16

(Orukkam - 2017)

Write the sequence of numbers which leaves the remainder 3 on dividing by 5 and 10.

 Sequence = 3, 13, 23, 33, ....

Qn. 17


(Orukkam - 2017)

Look at the sequence

$$1 + (1 + 5), 2 + (2 + 5), 3 + (3 + 5), \dots$$

a) Write next two terms.

b) Write its algebra.


 a)  $1 + (1 + 5), 2 + (2 + 5), 3 + (3 + 5), 4 + (4 + 5),$   
 $5 + (5 + 5)$

b)  $x_n = 2n + 5$

Qn. 18

(Orukkam - 2017)

The difference between 12<sup>th</sup> term and 8<sup>th</sup> term of an arithmetic sequence is 20. Find the common difference.

  $x_{12} - x_8 = 20$

$$4d = 20$$

$$d = 5, \text{ Common difference} = 5$$