



NCERT Solutions For Class 10 Chapter 5 Maths Arithmetic
Progressions Exercise 5.3

1. Find the sum of the following AP's.

(i) 2, 7, 12... to 10 terms

(ii) -37, -33, -29... to 12 terms

(iii) 0.6, 1.7, 2.8... to 100 terms

(iv) $\frac{1}{15}, \frac{1}{12}, \frac{1}{10}, \dots$ to 11 terms

Ans. (i) 2, 7, 12... to 10 terms

Here First term = $a = 2$,

Common difference = $d = 7 - 2 = 5$ and $n = 10$

Applying formula, $S_n = \frac{n}{2}[2a + (n-1)d]$ to find sum of n terms of AP,

$$S_n = \frac{10}{2}[4 + (10-1)5] = 5(4 + 45) = 5 \times 49 = 245$$

(ii) -37, -33, -29... to 12 terms

Here First term = $a = -37$, Common difference = $d = -33 - (-37) = 4$

And $n = 12$

Applying formula, $S_n = \frac{n}{2}[2a + (n-1)d]$ to find sum of n terms of AP,

$$S_n = \frac{12}{2}[-74 + (12-1)4] = 6(-74 + 44) = 6 \times (-30) = -180$$

(iii) 0.6, 1.7, 2.8... to 100 terms

Here First term = $a = 0.6$, Common difference = $d = 1.7 - 0.6 = 1.1$

And $n = 100$

Applying formula, $S_n = \frac{n}{2}[2a + (n-1)d]$ to find sum of n terms of AP,

$$S_n = \frac{100}{2}[1.2 + (100-1)1.1] = 50(1.2 + 108.9) = 50 \times 109.5 = 5505$$

(iv) $\frac{1}{15}, \frac{1}{12}, \frac{1}{10}, \dots$ to 11 terms

Here First term = $a = \frac{1}{15}$ Common difference = d

$$= \frac{1}{12} - \frac{1}{15} = \frac{5-4}{60} = \frac{1}{60}$$

Applying formula, $S_n = \frac{n}{2}[2a + (n-1)d]$ to find sum of n terms of AP,

$$S_n = \frac{11}{2} \left[\frac{2}{15} + (11-1) \frac{1}{60} \right] = \frac{11}{2} \left(\frac{2}{15} + \frac{1}{6} \right) = \frac{11}{2} \left(\frac{4+5}{30} \right) = \frac{11}{2} \times \frac{9}{30} = \frac{33}{20}$$

2. Find the sums given below:

(i) $7 + 10\frac{1}{2} + 14 + \dots + 84$

(ii) $34 + 32 + 30 + \dots + 10$

(iii) $-5 + (-8) + (-11) + \dots + (-230)$

Ans. (i) $7 + 10\frac{1}{2} + 14 + \dots + 84$

Here First term = $a = 7$, Common difference = d

$$= \frac{21}{2} - 7 = \frac{21-14}{2} = \frac{7}{2} = 3.5$$

And Last term = $l = 84$

We do not know how many terms are there in the given AP.

So, we need to find n first.

Using formula $a_n = a + (n-1)d$, to find n^{th} term of arithmetic progression,

$$[7 + (n-1)(3.5)] = 84$$

$$\Rightarrow 7 + (3.5)n - 3.5 = 84$$

$$\Rightarrow 3.5n = 84 + 3.5 - 7$$

$$\Rightarrow 3.5n = 80.5$$

$$\Rightarrow n = 23$$

Therefore, there are 23 terms in the given AP.

It means $n = 23$.

Applying formula, $S_n = \frac{n}{2}(a+l)$ to find sum of n terms of AP,

$$S_{23} = \frac{23}{2}(7+84)$$

$$\Rightarrow S_{23} = \frac{23}{2} \times 91 = 1046.5$$

(ii) $34 + 32 + 30 + \dots + 10$

Here First term = $a = 34$, Common difference =
 $d = 32 - 34 = -2$

And Last term = $l = 10$

We do not know how many terms are there in the given AP.

So, we need to find n first.

Using formula $a_n = a + (n - 1)d$, to find n^{th} term of arithmetic progression,

$$[34 + (n - 1)(-2)] = 10$$

$$\Rightarrow 34 - 2n + 2 = 10$$

$$\Rightarrow -2n = -26 \Rightarrow n = 13$$

Therefore, there are 13 terms in the given AP.

It means $n = 13$.

Applying formula, $S_n = \frac{n}{2}(a + l)$ to find sum of n terms of AP,

$$S_{13} = \frac{13}{2}(34 + 10) = \frac{13}{2} \times 44 = 286$$

(iii) $-5 + (-8) + (-11) + \dots + (-230)$

Here First term = $a = -5$, Common difference =
 $d = -8 - (-5) = -8 + 5 = -3$

And Last term = $l = -230$

We do not know how many terms are there in the given AP.

So, we need to find n first.

Using formula $a_n = a + (n - 1)d$, to find n^{th} term of arithmetic progression,

$$[-5 + (n - 1)(-3)] = -230$$

$$\Rightarrow -5 - 3n + 3 = -230$$

$$\Rightarrow -3n = -228 \Rightarrow n = 76$$

Therefore, there are 76 terms in the given AP.

It means $n = 76$.

Applying formula, $S_n = \frac{n}{2}(a + l)$ to find sum of n terms of AP,

$$S_{76} = \frac{76}{2}(-5 - 230) = 38 \times (-235) = -8930$$

3. In an AP

(i) given $a = 5, d = 3, a_n = 50$, find n and S_n .

(ii) given $a = 7, a_{13} = 35$, find d and S_{13} .

(iii) given $a_{12} = 37, d = 3$, find a and S_{12} .

(iv) given $a_3 = 15, S_{10} = 125$, find d and a_{10} .

(v) given $d = 5, S_9 = 75$, find a and a_9 .

(vi) given $a = 2, d = 8, S_n = 90$, find n and a_n .

(vii) given $a = 8, a_n = 62, S_n = 210$, find n and d .

(viii) given $a_n = 4, d = 2, S_n = -14$, find n and a .

(ix) given $a = 3, n = 8, S = 192$, find d .

(x) given $l = 28, S = 144$, and there are total of 9 terms. Find a .

Ans. (i) Given $a = 5, d = 3, a_n = 50$, find n and S_n .

Using formula $a_n = a + (n - 1)d$, to find n^{th} term of arithmetic progression,

$$a_n = 5 + (n - 1)(3)$$

$$\Rightarrow 50 = 5 + 3n - 3$$

$$\Rightarrow 48 = 3n \Rightarrow n = 16$$

Applying formula, $S_n = \frac{n}{2}[2a + (n - 1)d]$ to find sum of n terms of AP,

$$S_{16} = \frac{16}{2}[10 + (16 - 1)3] = 8(10 + 45) = 8 \times 55 = 440$$

Therefore, $n = 16$ and $S_n = 440$

(ii) Given $a = 7, a_{13} = 35$, find d and S_{13} .

Using formula $a_n = a + (n - 1)d$, to find n^{th} term of arithmetic progression,

$$a_{13} = 7 + (13 - 1)(d)$$

