

Arithematic Progressions Ex 19.2 Q1

(i) 10th term of A.P 1, 4, 7, 10,... Here, 1st term = $a_1 = 1$ and common difference d = 4 - 1 = 3We know $a_n = a_1 + (n - 1)d$

$$a_{10} = a_1 + (10 - 1)d$$
$$= 1 + (10 - 1)3 \Rightarrow 28$$

- (ii) To find 18th term of A.P $\sqrt{2}$, $3\sqrt{2}$, $5\sqrt{2}$,... Here, 1st term $a_1 = \sqrt{2}$ and $d = \text{common difference} = 2\sqrt{2}$ $a_n = a_1 + (n-1)d$ $a_{18} = \sqrt{2} + 2\sqrt{2} (17) = 35\sqrt{2}$
- (iii) Find *n*th term of A.P 13,8,3,-2 Here, $a_1 = 13$ d = -5 $a_n = a + (n-1)d$ = 13 + (n-1)(-5) = -5n + 18

Arithematic Progressions Ex 19.2 Q2

It is given that the sequence $\langle a_n \rangle$ is an A.P

$$\therefore \quad a_n = a + (n-1)d \qquad \qquad ---(i)$$

Similarly from (i)

$$a_{m+n} = a + (m+n-1)d$$
 ---(ii)
 $a_{m-n} = a + (m-n-1)d$ ---(iii)

Adding (ii) and (iii)

$$\begin{aligned} a_{m+n} + a_{m-n} &= \left(a + \left(m + n - 1 \right) d \right) + \left(a + \left(m - n - 1 \right) d \right) \\ &= 2a + \left(m + n - 1 + m - n - 1 \right) d \\ &= 2a + 2d \left(m - 1 \right) \\ &= 2 \left(a + \left(m - 1 \right) d \right) \\ &= 2a_m \text{ Hence proved.} \end{aligned}$$

Arithematic Progressions Ex 19.2 Q3

(i) Let nth term of A.P = 248

∴
$$a_n = 248 = a + (n - 1)d$$

⇒ $248 = 3 + (n - 1)5$
∴ $n = 50$

- : 50th term of the given A.P is 248.
- (ii) Which term of A.P 84,80,76 is 0?

 Let nth term of A.P be 0

Then,
$$a_n = 0 = a + (n-1)d$$

 $0 = 84 + (n-1)(-4)$

$$\therefore n = 22$$

- : 22nd term of the given A.P is 0.
- (iii) Which term of A.P is 4, 9, 14, ... is 254? Let n th term of A.P be 254

$$a_n = a + (n-1)d$$

254 = 4 + (n - 1)5

$$n = 51$$

: 51st term of the given A.P is 254.

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