Arithematic Progressions Ex 19.2 Q1

(i) 10th term of A.P $1, 4, 7, 10, \ldots$

Here, 1st term $= a_1 = 1$

and common difference $d = 4 - 1 = 3$

We know $a_n = a_1 + (n-1)d$

$\therefore \quad a_{10} = a_1 + (10-1)d$

$= 1 + (10-1)3 \Rightarrow 28$

(ii) To find 18th term of A.P $\sqrt{2}, 3\sqrt{2}, 5\sqrt{2}, \ldots$

Here, 1st term $a_1 = \sqrt{2}$

and d = common difference $= 2\sqrt{2}$

$\therefore \quad a_n = a_1 + (n-1)d$

$a_{18} = \sqrt{2} + 2\sqrt{2}(17) = 35\sqrt{2}$

(iii) Find nth term of A.P $13, 8, 3, -2$

Here, $a_1 = 13$

$d = -5$

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

$= 13 + (n-1)(-5)$

$= -5n + 18$

Arithematic Progressions Ex 19.2 Q2

It is given that the sequence $< a_n >$ is an A.P

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

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

Arithematic Progressions Ex 19.2 Q3

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

$\therefore \quad a_n = 248 = a + (n-1)d$

$\Rightarrow \quad 248 = 3 + (n-1)5$

$\therefore \quad n = 50$

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

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

$\therefore \quad n = 22$

$\therefore$ 22nd term of the given A.P is 0.

(iii) Which term of A.P is 4, 9, 14, ... is 254?

Let nth term of A.P be 254

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

$254 = 4 + (n-1)5$

$\therefore \quad n = 51$

$\therefore$ 51st term of the given A.P is 254.

********** END **********