Arithematic Progressions Ex 19.2 Q7

Given: $a = 5$

$d = 3$

a_n = last term = 80

Let there be n terms

$\therefore$ $a_n = 80 = a + (n - 1)d$

$80 = 5 + (n - 1)3$

$\Rightarrow$ $n = 26$

$\therefore$ Thus, thre are 26 terms in the given sequence.

Arithematic Progressions Ex 19.2 Q8

Given that:

$a_6 = 19 = a + (6 - 1)d$ --- (i)

$a_{17} = 41 = a + (17 - 1)d$ --- (ii)

Solving (i) and (ii), we get

$a = 9$ and $d = 2$

$\therefore$ $a_{40} = a + (40 - 1)d$

$= 9 + (40 - 1)2$

$= 9 + 39(2)$

$= 87$

40th term of the given sequence is 87.

Arithematic Progressions Ex 19.2 Q9

Given:

$a_9 = 0$

$\therefore$ $a + 8d = 0$

$a = -8d$ --- (i)

$a_{19} = a + (19 - 1)d$

$= a + 18d$

$= -8d + 18d$ $[\because a = -8d$ from (i)$]$

$= 10d$ --- (ii)

$a_{29} = a + (29 - 1)d$

$= -8d + 28d$ $[\because a = -8d$ from (i)$]$

$= 20d$ --- (iii)

From (ii) and (iii)

$a_{29} = 2a_{19}$ Hence proved.

Arithematic Progressions Ex 19.2 Q10

Given:

$$10a_{10} = 15a_{15}$$

$\Rightarrow \quad 10\left(a + (10-1)d\right) = 15\left(a + (15-1)d\right)$

$\Rightarrow \quad 10a + 90d = 15a + 210d$

$\Rightarrow \quad 5a + 120d = 0$

$\Rightarrow \quad a + 24d = 0 \hspace{5cm} ---(i)$

$\begin{aligned}
a_{25} &= a + (25-1)d \\
&= a + 24d \\
&= 0 \hspace{3cm} \left[\because \text{from } (i)\, a + 24d = 0\right]
\end{aligned}$

Hence proved.

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