12. The sum of the first four terms of an A.P. is 56. The sum of the last four terms is 112. If its first term is 11, then find the number of terms.

SOLUTION:

$a = 1$

$S_n = 56$

We know that the sum of n terms of an AP whose

First Term = a

and Common Difference = d

is given by

$$S_n = \frac{n}{2}[2a + (n-1)d]$$

$$\Rightarrow 56 = \frac{4}{2}[2 + (n-1)d] \Rightarrow d = 2$$

Let the last term be a_n, so the sum of the last five terms is given by

$$S_4 = \frac{4}{2}[2a_n + (n-1)(-d)] = 112$$

$$\Rightarrow 2[2a_n + (4-1)(-2)] = 112 \Rightarrow a_n = 31$$

We know that the n^{th} term of an Arithmetic Progression, whose

First term = a

and Common Difference = d

is given by

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

$$\Rightarrow a_n = 31 = 1 + (n-1).2 \Rightarrow n = 11$$