

## Arithmetic Progressions Ex 9.3 Q13 Answer:

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In the given problem, we need to find the 12<sup>th</sup> term from the end for the given A.P.
(i) 3, 5, 7, 9 ...201
Here, to find the 12<sup>th</sup> term from the end let us first find the total number of terms. Let us take the total
number of terms as n.
So,
First term (a) = 3
Last term (a_n) = 201
Common difference (d) = 5-3
= 2
Now, as we know,
a_n = a + (n-1)d
So, for the last term,
   201 = 3 + (n-1)2
   201 = 3 + 2n - 2
   201 = 1 + 2n
201-1=2n
Further simplifying,
200 = 2n
n = \frac{200}{2}
n = 100
 So, the 12<sup>th</sup> term from the end means the 89<sup>th</sup> term from the beginning.
 So, for the 89^{th} term (n = 89)
 a_{89} = 3 + (89 - 1)2
    =3+(88)2
    =3+176
 Therefore, the 12<sup>th</sup> term from the end of the given A.P. is 179
 (ii) 3, 8, 13 ... 253
 Here, to find the 12<sup>th</sup> term from the end let us first find the total number of terms. Let us take the total
 number of terms as n.
 So,
 First term (a) = 3
 Last term (a_n) = 253
 Common difference, d = 8 - 3
 = 5
 Now, as we know,
 a_n = a + (n-1)d
 So, for the last term,
    253 = 3 + (n-1)5
    253 = 3 + 5n - 5
    253 = -2 + 5n
 253 + 2 = 5n
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255 = 5n
n = \frac{255}{}
So, the 12<sup>th</sup> term from the end means the 40<sup>th</sup> term from the beginning.
So, for the 40^{th} term (n = 40)
a_{40} = 3 + (40 - 1)5
   =3+(39)5
   =3+195
   =198
Therefore, the 12<sup>th</sup> term from the end of the given A.P. is 198
(iii) 1, 4, 7, 10 ...88
Here, to find the 12<sup>th</sup> term from the end let us first find the total number of terms. Let us take the total
So,
First term (a) = 1
Last term (a_n) = 88
Common difference, d=4-1=3
Now, as we know,
a_n = a + (n-1)d
So, for the last term,
   88 = 1 + (n-1)3
   88 = 1 + 3n - 3
    88 = -2 + 3n
88 + 2 = 3n
Further simplifying,
90 = 3n
n = \frac{90}{3}
n = 30
So, the 12th term from the end means the 19th term from the beginning.
So, for the 19^{th} term (n = 19)
a_{19} = 1 + (19 - 1)3
    =1+(18)3
     =1+54
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Therefore, the 12th term from the end of the given A.P. is 55

= 55