Maths Worksheet (class X)

Chapter -5, Arithmetic Progression

Q.1 Tick the correct answer:

1) The common difference of an AP in which $a_{25} - a_{12} = -52$ is

(a) 4 (b) −4 (c) −3 (d) 3

2) If the common difference of an AP is −6, then what is $a_{16} - a_{12}$?

(a) −24 (b) 24 (c) −30 (d) 30

3) The 9th term of an AP is 449 and 449th term is 9. The term which is equal to zero is

(a) 501th (b) 502th (c) 508th (d) None of these

4) In an AP if $a = -15$, $a_n = 1$ and $S_n = -63$, then n is

(a) 9 (b) 10 (c) 11 (d) 12

5) The common difference of an AP whose n^{th} term is $6n+2$ is

(a) 8 (b) 6 (c) 4 (d) 2

6) Which term of the AP 18, 23, 28, 33, ... is 98?

(a) 15th (b) 16th (c) 17th (d) 18th

Q.2 For what value of k are $2k$, $k+10$ and $3k+2$ in AP?

Q.3 If the sum of the first p terms of an AP is $ap^2 + bp$, find its common difference.

Q.4 Which term of the AP 115, 110, 105, ... is its first negative term?

Q.5 For what value of n, are the nth terms of two AP's : 15, 12, 9, ... and −15, −13, −11 .... equal?

Q.6 Three numbers whose sum is 21 are in AP. If the product of the first and the third numbers exceeds the second number by 6, find the numbers.

Q.7 How many terms of the series 54, 51, 48, ... be taken so that, their sum is 513? Explain the double answer.

Q.8 Divide 56 into four parts which are in AP such that the ratio of product of extremes to the product of mean is 5:6.

Q.9 If the mth term of an AP is n and the nth term is m, prove that its kth term is $(m+n-k)$.

Q.10 Determine k so that k^2+4k+8, $2k^2+3k+6$, $3k^2+4k+4$ are the three consecutive terms of an AP.

Q.11 If S_n denotes the sum of first n terms of an AP, prove that $S_{12} = 3(S_8 - S_4)$.

Q.12 The ratio of 11th term to the 18th term of an AP is 2:3. Find the ratio of the 5th term to the 21st term, and also the ratio of the sum of the first five terms to the sum of the first 21 terms.

Q.13 Reshma repays her total loan of ₹ 1,75,000 by paying every month starting with the first installment of ₹ 1500. If she increases the installment by ₹ 175 every month, what amount will be paid by her in the 21st installment? What amount of loan does she still have to pay after the 21st installment?

Q.14 The sum of the first n terms of an AP is given by $S_n = 3n^2 - 4n$. Determine the AP and the 12th term.

Q.15 If the mth term of an AP is $\frac{1}{n}$ and n^{th} term is $\frac{1}{m}$, then show that its $(mn)^{th}$ term is 1.

Q.16 If the sum of m terms of an AP is the same as the sum of its n terms, show that the sum of its $(m+n)$ terms is zero.

Q.17 The ratio of the sums of m and n terms of an AP is $m^2 : n^2$. Show that the ratio of the mth and n^{th} terms is $(2m-1):(2n-1)$.

Q.18 The sum of n, $2n$, $3n$ terms of an AP are S_1, S_2 and S_3 respectively. Prove that $S_3 = 3(S_2 - S_1)$.