

Arithmetic Progression

- Q. 1. Find the roots: $(x + 2) / (x - 2) + (x - 2) / (x + 2) = 5/2$, $x \neq 2$, $x \neq -2$
- Q. 2. Determine the values of p for which the quadratic equation: $2x^2 + px + 8 = 0$ has real roots.
- Q. 3. A shopkeeper buys a number of bananas for Rs. 600. If he had bought 10 dozen more bananas for the same amount, each dozen would have cost him Rs. 2 less. Find the number of bananas bought by him.
- Q. 4. If the roots of the equation $(c^2 - ab)x^2 - 2(a^2 - bc)x + b^2 - ac = 0$ are equal, prove that either $a=0$ or $a^3 + b^3 + c^3 = 3abc$
- Q. 5. Find three consecutive positive integers whose product is equal to sixteen times their sum.
- Q. 6. A fraction becomes $6/5$ if 1 is added to each of the numerator and the denominator. However, if we subtract 5 from each, the fraction becomes $3/2$. find the fraction.
- Q. 7. For what value of k , the system of equations: $2x - ky + 3 = 0$, $4x + 6y - 5 = 0$ is consistent?
- Q. 8. Solve graphically: $x + 4y = 10$, $y + 3x = 8$.
- Q. 9. If $a_1, a_2, a_3, a_4, a_5, \dots$ are the n terms of an A.P. Derive the formula for its n th term.
- Q. 10. If $a_1, a_2, a_3, a_4, a_5, \dots$ are the n terms of an A.P. Derive the formula for the sum of its n terms.
- Q. 11. If n th term of an A.P. is given by $a_n = 5n - 3$. Find the sum of its 50 terms.
- Q. 12. Sum of n terms of a sequence is given by $S_n = 2n^2 - 2n$. If it is an A.P. then find its 20th term.
- Q. 13. Find the sum of the following series: $10 + 14 + 18 + 22 + \dots + 104$

- Q. 14. If the sum of first 13 terms of an A.P. is 91 and sum of its first 30 terms is 465. Find the sum of its 50 terms.
- Q. 15. The sum of three numbers which are in A.P. is 9 and sum of their squares is 35. Find the numbers.
- Q. 16. Divide 32 into 4 parts such that they are in AP and the ratio of the product of first term and fourth terms = product of second and third terms is equal to $7/15$.
- Q. 17. If the p th, q th, r th terms of an AP are a, b, c then prove $a(q - r) + b(r - p) = c(q - p)$
- Q. 18. If p th term of an A.P. be $1/q$ and the q th term be $1/p$, show that the sum of pq terms is
- Q. 19. The sum of n terms of an A.P. is given by $S_n = 5n^2 + 3n$, find the n th term of A.P.
- Q. 20. How many terms of the A.P. $-6, -11/2, -5, \dots$ are needed to give the sum -25 ? Explain the double answer.
- Q. 21. Find the 30th and 60th terms of the following sequence:
- (1) 13, 18, 23, 28, 33, (2) $-10, -7, -4, -1, \dots$
- Q. 22. Find the sum of the following series:
1. $3+8+13+18+23, \dots, 248$ 2. $-10, -15, -20, -25, \dots, -105$
- Q. 23. The sum of three numbers which are in A.P. is 9 and sum of their squares is 35. Find the numbers.
- Q. 24. n th term of a sequence is given by the formula $a_n = 10 - 3n$, find the sum of its 20 terms.
- Q. 25. The 8th term of an A.P. is 32 and its 12th term is 52. Find the A.P.
- Q. 26. 500 logs are stacked in a way such that 32 logs in the bottom row, 31 in the next row, 30 in the row next to it and so on. In how many rows are the 500 logs placed and how many logs are in the top row?