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ARITHMETIC PROGRESSION
ASSIGNMENT NO. 5

1. If the sum of first n terms of an A.P. is given by $S_n = 4n^2 - 3n$, find the n^{th} term of the A.P.
2. The sum of three numbers in an A.P. is 27 and their product is 405. Find the numbers.
3. If S_n denotes the sum of first n terms of an A.P., prove that $S_{12} = 3(S_8 - S_4)$
4. If the numbers a, b, c, d, e form an A.P., then find the value of $a - 4b + 6c - 4d + e$
5. If $(m+1)^{th}$ term of an A.P. is twice the $(n+1)^{th}$ term, prove that $(3m+1)^{th}$ term is twice the $(m+n+1)^{th}$ term.
6. The p^{th} term of an A.P. is q and q^{th} term is p, find its $(p+q)^{th}$ term.
7. If the sum of m terms of an A.P. is same as the sum of n terms, show that the sum of its $(m+n)$ terms is zero.
8. If the sum of first m terms of an A.P. is n and sum of first n terms is m, then show that the sum of its first $(m+n)$ terms is $-(m+n)$.
9. Find the sum of all three digit numbers which leave the remainder 2 when divided by 5.
10. If m^{th} term of an A.P. is $\frac{1}{n}$ and n^{th} term is $\frac{1}{m}$, show that the sum of its mn terms is $\frac{1}{2}(mn+1)$.
11. If S_1, S_2, S_3 be the sums of $n, 2n$ and $3n$ terms respectively of an A.P., prove that $S_3 = 3(S_2 - S_1)$.
12. Prove that no matter what the real numbers a and b are, the sequence with n^{th} term $a + nb$ is always an A.P. What is the common difference? What is the sum of first 20 terms?