



INDIAN SCHOOL AL WADI AL KABIR

Department: Mathematics

Class X

Worksheet – Arithmetic Progressions (DTQ)

04 – 11 - 2024

Questions of 2 marks each

Q.1.	If the n th term of an A.P is $2n + 1$, then find the sum of its first three terms.
Q.2.	If the 8 th term of an A.P is 37 and its 12 th term is 57. Find the A.P.
Q.3.	For the A.P, $a_1, a_2, a_3, \dots$, if $\frac{a_4}{a_7} = \frac{2}{3}$, then find $\frac{a_6}{a_8}$.
Q.4.	Find the number of natural numbers between 102 and 998 which are divisible by 2 and 5 both.
Q.5.	If 7 times the seventh term of the AP is equal to 5 times the fifth term, then find the value of its 12th term.

Questions of 3 marks each

Q.6.	The sum of first 6 terms of an A.P is 42. The ratio of its 10 th term to its 30 th term is 1:3. Find the first term and thirteenth term of the A.P.
Q.7.	If the sum of first m terms of an AP is the same as the sum of its first n terms, show that the sum of its first $(m + n)$ terms is zero.
Q.8.	An AP 5, 8, 11...has 40 terms. Find the last term. Also find the sum of the last 10 terms.
Q.9.	A thief runs with a uniform speed of 100 m/minute. After one minute a policeman runs after the thief to catch him. He goes with a speed of 100 m/minute in the first minute and increases his speed by 10 m/minute every succeeding minute. After how many minutes the policeman will catch the thief.
Q.10.	Divide 56 in four parts in A.P. such that the ratio of the product of their extremes (1 st and 4 th) to the product of means (2 nd and 3 rd) is 5: 6.

Questions of 5 marks each

Q.11.	Find the middle term of the sequence formed by all three-digit numbers which leave a remainder 3, when divided by 4. Also find the sum of all numbers on both sides of the middle term separately.
Q.12.	Find the sum of the following series: $5 + (-41) + 9 + (-39) + 13 + (-37) + 17 + \dots + (-5) + 81 + (-3)$

Q.13.	How many terms of the Arithmetic Progression 45, 39, 33, ... must be taken so that their sum is 180? Explain the double answer.
Q.14.	The sum of three numbers in AP is 12 and sum of their cubes is 288. Find the numbers.
Q.15.	Solve for x: $1 + 4 + 7 + 10 + \dots + x = 287$

Case study question (4 marks)

Q.16.	The school auditorium was to be constructed to accommodate at least 1500 people. The chairs are to be placed in concentric circular arrangement in such a way that each succeeding circular row has 10 seats more than the previous one.  Based on the given information, answer the following questions: (i) If the first circular row has 30 seats, how many seats will be there in the 10th row? (ii) If there were 17 rows in the auditorium, how many seats will be there in the middle row? (iii) For 1500 seats in the auditorium, how many rows need to be there? OR (iv) If 1500 seats are to be arranged in the auditorium, how many seats are still left to be put after 12th row?
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ANSWERS

Q.1.	15	Q.2.	2, 7, 12, ...	Q.3.	$\frac{4}{5}$	Q.4.	89
Q.5.	0	Q.6.	2, 26	Q.8.	122, 1085	Q.9.	5 minutes
Q.10.	8, 12, 16, 20 or 20, 16, 12, 8	Q.11.	551, 36400, 87024	Q.12.	420	Q.13.	$n = 10$ or 6
Q.14.	2, 4, 6 or 6, 4, 2	Q.15.	40	Q.16.	(i) 120 (ii) 110	Q.16.	(iii) 15 (iv) 480