	INDIAN SCHOOL AL WADI AL KABIR

Department of Mathematics

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Class X, Mathematics (2023-24)

Worksheet– ARITHMETIC PROGRESSIONS

CASE STUDY QUESTIONS

CASE STUDY A:

A road roller (sometimes called a roller-compactor, or just roller) is a compactor-type engineering vehicle used to compact soil, gravel, concrete, or asphalt in the construction of roads and foundations. Similar rollers are used also at landfills or in agriculture. Road rollers are frequently referred to as steamrollers, regardless of their method of propulsion.

XYZ Machine Pvt Ltd started making road roller 10 year ago. Company increased its production uniformly by fixed number every year. The company produces 800 rollers in the 6th year and 1130 roller in the 9th year.

Based on the above information, answer the following questions.

Q1.	What was the company's production in first year?
Q2.	What was the company's production in the 8th year?
Q3.	What was the company's total production of the first 6 years?
Q4.	What was the increase in the company's production every year?
Q5.	In which year the company's production was 1350 rollers?

CASE STUDY B:

Your friend Veer wants to participate in a 200m race. He can currently run that distance in 51 seconds and with each day of practice it takes him 2 seconds less. He wants to do in 31 seconds.

Based on the above information, answer the following questions.

Q6.	What will be the A.P. for the above given information?
Q7.	What is the minimum number of days he needs to practice till his goal is achieved?
Q8.	Which of the following term is not in the A.P. of the above situation? 41, 30, 37, 39
Q9.	If n^{th} term of an A.P. is given by $a_n = 2n + 3$, then the common difference of an A.P. is given by
Q10.	The value of x, for which $2x$, $x + 10, 3x + 2$ are three consecutive terms of an A.P.

CASE STUDY C:

Rampal deposits some money in bank and gets an increment on it every year. For example, Rampal deposits some money p in bank and get an interest of I on it every year. Then this is represented as $p, p + I, p + 2I, p + 3I, \dots$ The sequence $p, p + I, p + 2I, p + 3I \dots$ form an A.P. , with first term p and common difference I.

	Based on the above information, answer the following questions.
Q11.	If $4p + 8, 2p^2 + 3p + 6$ and $3p^2 + 4p + 4$ form three consecutive terms of A.P. then p is
Q12.	The 12th term of A.P., 10.0, 10.5, 11.0, 11.5 is
Q13.	If the 17th term of an A.P. exceeds its 10th term by 14, then the common difference is
Q14.	The common difference of an A.P. $\dfrac{1}{x}$, $\dfrac{1-x}{x}$, $\dfrac{1-2x}{x}$ is
Q15.	The qth term of the A.P. $\dfrac{1}{p}$, $\dfrac{1+p}{p}$, $\dfrac{1+2p}{p}$ is

CASE STUDY D:

Your elder brother wants to buy a car and plans to take loan from a bank for his car. He repays his total loan of ₹ 1,18,000 by paying every month starting with the first instalment of ₹ 1000. If he increases the instalment by ₹ 100 every month.

Based on the above information, answer the following questions.

Q16.	The amount paid by him in 30th installment is
Q17.	The amount paid by him in the 30 installments is
Q18.	What amount does he still have to pay after 30th installment?
Q19.	If total installments are 40 then amount paid in the last installment?
Q20.	The ratio of the 1st installment to the last installment is

Answers									
Answers	**1**	250	**2**	1020	**3.**	3105	**4**	110
	5	11ᵗʰ	**6**	51,49,...,31	**7**	11	**8**	30
	9	2	**10**	6	**11**	P=0,p=2	**12**	15.5
	13	2	**14**	−1	**15**	$\dfrac{1 + (q-1)p}{p}$	**16**	₹ 3900
	17	₹ 73500	**18**	₹ 44500	**19**	₹ 4900	**20**	10 : 49