

DELHI PUBLIC SCHOOL
WEEKLY
CLASS
MATHEMATICS - SET
/2025

RAM

TIME ALLOWED : 2 Periods

M.M. : 40

General Instructions

1. Section A contains 4 questions of 1 mark each.
2. Section B contains 4 questions of 2 marks each.
3. Section C contains 4 questions of 3 marks each.
4. Section D contains 4 questions of 4 marks each.

QNo	SECTION A
1.	Find the domain of the real valued function $f(x) = \frac{x^2+2x+3}{x^2+6x+8}$.
2.	Find the mean deviation from the mean for the data 3, 4, 5, 6, 7.
3.	Find the sum of the GP $\sqrt{2} + \frac{1}{\sqrt{2}} + \frac{1}{2\sqrt{2}} + \dots$ to 8 terms.
4.	If $f(x) = \frac{x+3}{3x-1}$, $x \neq \frac{1}{3}$, $x \in \mathbb{R}$, find the value of x for which $f(x-2) = f(-4)$.
	SECTION B
5.	If the 4^{th} and 9^{th} terms of a GP be 54 and 13122 respectively, find the common ratio and first term of the GP.
6.	If the sum of the squares of the deviations of 10 observations taken from the mean is 2.5, then find the value of their standard deviation.
7.	Redefine the function given by $f(x) = x+3 + x-4 $, $-5 \leq x \leq 5$.
8.	Find the fourth term from the end of the GP $\frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \frac{1}{54}, \dots, \frac{1}{4374}$.
	SECTION C
9.	Define the Signum function. Draw its graph and write its domain and range.
10.	Find two positive numbers whose difference is 12 and whose Arithmetic Mean exceeds the Geometric Mean by 2.
11.	If $[x]^2 - 9[x] + 20 = 0$, where $[]$ denotes the greatest integer function, find x .

12.

Calculate the mean deviation from the median of the following data

x_i	18	23	28	33	38	43	48	53
f_i	5	6	12	14	26	12	16	9

SECTION D

13.

If the first and the n^{th} term of a G.P. are a and b , respectively, and if P is the product of n terms, prove that $P^2 = (ab)^n$.

14.

Let $f = \left\{ \left(x, \frac{x^2}{1+x^2} \right) : x \in \mathbb{R} \right\}$ be a function from $\mathbb{R}$ to $\mathbb{R}$. Determine the domain and range of f .

15.

Calculate the mean and standard deviation for the following table given the age distribution of a group of people

Age	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of persons	3	51	127	141	130	51	2

16.

Find the sum of 50 terms of the sequence
7, 77, 777, 7777,

Handwritten calculations for problem 16:

Sequence: 7, 77, 777, 7777, ...

Sum of 50 terms:

$$S_{50} = 7 + 77 + 777 + \dots + 7777777777$$

Using the formula for the sum of a geometric series:

$$S_n = \frac{a(r^n - 1)}{r - 1}$$

Where $a = 7$, $r = 10$, $n = 50$:

$$S_{50} = \frac{7(10^{50} - 1)}{10 - 1} = \frac{7(10^{50} - 1)}{9}$$

Final result:

$$S_{50} = \frac{7}{9}(10^{50} - 1)$$

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