Unit 6 · Sequence and Series

HARDER WORKSHEET

Full marks 23

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 23

1 Work backwards [3]

Solve the following problem. Show your working.

The sum of the first n terms of a series is $S_n = 3n^2 + 2n$ for every n. Find its first three terms, and show that it is an arithmetic series.

Answer: _____

2 A real setting [3]

Solve the following problem. Show your working.

Shyam borrows Rs 1,00,000 and repays Rs 10,000 of it at the end of every month for 10 months. With each repayment he also pays 1% interest on what he still owed that month: Rs 1,000 the first month, Rs 900 the second, and so on. How much interest does he pay in all?

Answer: _____

3 Two means, two numbers [3]

Solve the following problem. Show your working.

The arithmetic mean of two positive numbers is 25 and their geometric mean is 7. Find the numbers.

Answer: _____

4 Show it [2]

Answer the following question.

Show that every arithmetic sequence of 5 terms whose sum is 100 has 20 as its middle term. Then write two different such sequences.

5 Spot the error [3]

Find the mistake in the working and correct it.

Mina found the sum of the first 5 terms of $64 + 16 + 4 + \cdots$ as $\frac{64[1-(1/4)^5]}{1+1/4} = 51.15$.

6 When does it overtake? [3]

Answer the following question. Show your working.

Series A is $2 + 5 + 8 + \cdots$ and series B is $1 + 2 + 4 + \cdots$. After how many terms is the sum of B first bigger than the sum of A?

Answer: _____

7 Is the claim true? [3]

Answer the following question. Give a reason.

A video says: “Save Rs 1 today, Rs 2 tomorrow, Rs 4 the next day, doubling every day, and in three weeks you will have saved more than Rs 10 lakh.” Is it true? On which day does the total first pass Rs 10,00,000?

8 A bouncing ball [3]

Solve the following problem. Show your working.

A ball is dropped from 5 m. Each time it bounces back to $\frac{4}{5}$ of the height it fell. How far has it traveled when it hits the floor for the fourth time? What distance can it never pass, however long it bounces?

Answer: _____