Unit 6 · Sequence and Series

WORKSHEET

Full marks 34

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 34

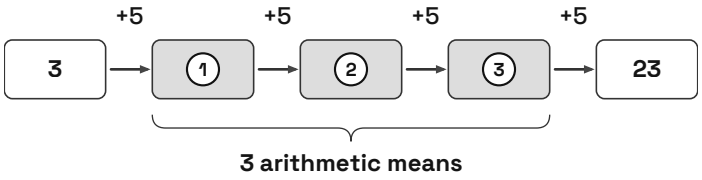
1 Key words [3.5]

Match each word or formula in Column A with its meaning in Column B. Write the letter in the box. One meaning in Column B is not needed. Each match carries 0.5 mark.

Column A		Column B
1. arithmetic means	☐	**a.** the terms of a sequence written with plus signs between them
2. geometric means	☐	**b.** the number each term of a geometric sequence is multiplied by
3. common difference	☐	**c.** the sum of an arithmetic series
4. common ratio	☐	**d.** the sum of a geometric series
5. series	☐	**e.** the terms between two terms of a geometric sequence
6. $\frac{n}{2}(a + l)$	☐	**f.** the terms between two terms of an arithmetic sequence
7. $\frac{a(r^n - 1)}{r - 1}$	☐	**g.** the number added to each term of a geometric sequence
		h. the number added to each term of an arithmetic sequence

2 Fill the diagram [1.5]

The drawing shows three arithmetic means between 3 and 23. Write the number that belongs in each numbered box. Each carries 0.5 mark.



1. _____ **2.** _____

3. _____

3 Multiple choice [5]

Choose the correct option for each of the following questions.

i. For two positive numbers a and b, which is their geometric mean? [1]

a. $\frac{a + b}{2}$ **b.** $\sqrt{ab}$

c. ab **d.** $\frac{ab}{2}$

ii. How many terms are there when 5 arithmetic means are inserted between two numbers? [1]

a. 5 **b.** 6
c. 7 **d.** 10

iii. What is $2 + 4 + 6 + \cdots + 40$? [1]

a. 400 **b.** 420
c. 440 **d.** 840

iv. What is $3 + 6 + 12 + \cdots$ to 6 terms? [1]

a. 96 **b.** 186
c. 189 **d.** 192

v. The terms of $30 + 26 + 22 + \cdots$ are added one by one. After how many terms is the sum first 0? [1]

a. 8 **b.** 15
c. 16 **d.** never

4 Very short answers [3]

Write very short answers to the following questions.

a. Write the formula for the sum of the first n terms of an arithmetic series with first term a and common difference d. [1]

b. Find the arithmetic mean between -6 and 20. [1]

c. Find the geometric mean between 3 and 48. [1]

5 Short answers [6]

Write short answers to the following questions.

a. Explain, by writing the series forwards and backwards, why $1 + 2 + 3 + \cdots + 50 = 1275$. [2]

b. Asha found the sum of the natural numbers from 20 to 60 as $\frac{40}{2}(20 + 60) = 1600$. Find her mistake and write the correct sum. [2]

c. Insert two geometric means between 4 and 108. **[2]**

6 Problems [13]

Solve the following problems. Show your working.

a. The third term of an arithmetic series is −15 and the eighth term is 10. Find the sum of its first 16 terms. **[3]**

Answer:

b. A worker in a garment factory made 1,000 Nepali caps (dhaka topi) in his first year, and 100 more each year than the year before. Can he make 15,000 caps in 10 years? **[3]**

Answer:

c. The second term of a geometric series is 4 and the seventh term is 128. Find the sum of its first 10 terms. **[3]**

Answer:

d. Sarita borrowed Rs 43,680 from her friend Garima, to be paid back in 6 installments, each three times the one before. Find the difference between the first and last installments. **[4]**

Answer: _____

7 Think **[2]**

Think, then answer.

A ball is dropped from 2 m and bounces back to half its height each time. Ram says: "If it bounces for ever, it travels for ever." Is he right? Explain using the distance up to the fifth time it hits the floor.

8 Activity: Measure a bounce (not marked)

Drop a ball (a tennis ball or a rubber ball) from 1 m beside a wall, and film it with a phone. Play the film slowly and read the height of each of the first three bounces against marks on the wall. Fill in the table.

	drop	1st bounce	2nd bounce	3rd bounce
height, cm	100			
this height ÷ the one before				

Is the ratio about the same each time? Use it to work out the total distance the ball travels up to its fourth time on the floor.