

SATISH CHANDRA MEMORIAL SCHOOL
STD-XI
MATHEMATICS
CLASS TEST-CHAPTER-SEQUENCE & SERIES
17/06/25

MM-27

TIME-1 HR

(1) Suppose x and y are two real numbers such that the r th mean between x and $2y$ is equal to the r th mean between $2x$ and y when n arithmetic means are inserted between them in both cases. Show that

$$\frac{n+1}{r} - \frac{y}{x} = 1$$

(2) Let S_k be the sum of first k terms of an A.P. What must this progression be for the ratio $\frac{S_{kx}}{S_x}$ to be independent of x ?

(3) Three numbers are in G.P. whose sum is 70. If the extremes be each multiplied by 4 and the mean by 5, they will be in A.P. Find the numbers.

(4) If $x = 1 + a + a^2 + \dots \infty$, where $|a| < 1$ and $y = 1 + b + b^2 + \dots \infty$, where $|b| < 1$. Prove that:

$$1 + ab + a^2b^2 + \dots \infty = \frac{xy}{x + y - 1}$$

(5) The sum of an infinite geometric series is 15 and the sum of the squares of these terms is 45. find the series.

(6) The sum of two numbers is 6 times their geometric means, show that the numbers are in the ratio

$$(3 + 2\sqrt{2}) : (3 - 2\sqrt{2})$$

(7) Find the sum of the series: $0.6 + 0.66 + 0.666 + \dots$ to n terms.

(8) Assertion-Reason based questions-

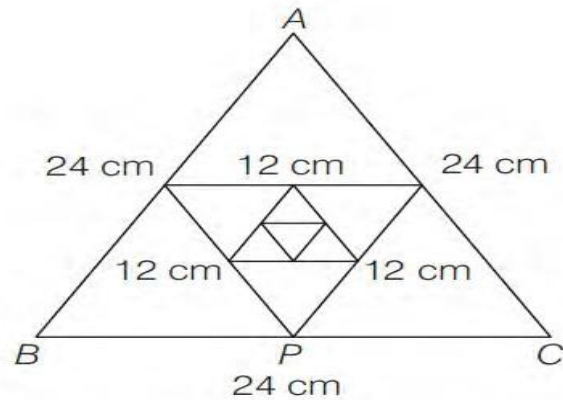
Answer the question selecting the appropriate option given below:

- (a) Both A and R are true and R is the correct explanation for A.
- (b) Both A and R are true but R is not the correct explanation for A.
- (c) A is true but R is false.
- (d) A is false but R is true.

Assertion(A): The three AM between 3 and 19 are 7, 11, 15.

Reason(R) : If a, A, b are in AP, then we say A is the AM of a and b .

(9) CASE STUDY-



Based on above information, answer the following questions.

- (i) The side of the 5th triangle is (in cm)
- (a) 3 (b) 6
(c) 1.5 (d) 0.75
- (ii) The sum of perimeter of first 6 triangle is (in cm)
- (a) $\frac{569}{4}$ (b) $\frac{567}{4}$ (c) 120 (d) 144
- (iii) The area of all the triangle is (in sq cm)
- (a) 576 (b) $192\sqrt{3}$
(c) $144\sqrt{3}$ (d) $169\sqrt{3}$
- (iv) The sum of perimeter of all triangle is (in cm)
- (a) 144 (b) 169
(c) 400 (d) 625
- (v) The perimeter of 7th triangle is (in cm)
- (a) $\frac{7}{8}$ (b) $\frac{9}{8}$ (c) $\frac{5}{8}$ (d) $\frac{3}{4}$