

PYQSide

JEE MAIN SEQUENCES AND SERIES — GEOMETRIC PROGRESSION AND GEOMETRIC MEAN — PYQS

Max. Marks: 52

Questions: 13

Section A (MCQ)

- Q.1** The sum of the first ten terms of an A.P. is 160 and the sum of the first two terms of a G.P. is 8. If the first term of the A.P. is equal to the common ratio of the G.P. and the first term of the G.P. is equal to common difference of the A.P., then the sum of all possible values of the first term of the G.P. is :

[JEE Main 2026 (Online) 6th April Morning Shift]

- (1) $\frac{34}{9}$ (2) $\frac{34}{13}$ (3) $\frac{32}{9}$ (4) $\frac{32}{13}$

Scan or tap for the full solution



- Q.2** Consider the quadratic equation $(n^2 - 2n + 2)x^2 - 3x + (n^2 - 2n + 2) = 0$, $n \in \mathbb{R}$. Let α be the minimum value of the product of its roots and β be the maximum value of the sum of its roots. Then the sum of the first six terms of the G.P., whose first term is α and the common ratio is $\frac{\alpha}{\beta}$, is :

[JEE Main 2026 (Online) 6th April Evening Shift]

- (1) $\frac{61}{37}$ (2) $\frac{121}{81}$ (3) $\frac{364}{243}$ (4) $\frac{1093}{729}$

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- Q.3** Let $a_1, a_2, a_3, \dots$ be an A.P. and $g_1 = a_1, g_2, g_3, \dots$ be an increasing G.P. If $a_1 = a_2 + g_2 = 1$ and $a_3 + g_3 = 4$, then $a_{10} + g_5$ is equal to:

[JEE Main 2026 (Online) 2nd April Evening Shift]

- (1) 81 (2) 76 (3) 62 (4) 55

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- Q.4** $\frac{6}{3^{26}} + \frac{10 \cdot 1}{3^{25}} + \frac{10 \cdot 2}{3^{24}} + \frac{10 \cdot 2^2}{3^{23}} + \dots + \frac{10 \cdot 2^{24}}{3}$ is equal to :

[JEE Main 2026 (Online) 28th January Evening Shift]

- (1) 2^{26} (2) 3^{25} (3) 3^{26} (4) 2^{25}

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- Q.5** Let 729, 81, 9, 1, ... be a sequence and P_n denote the product of the first n terms of this sequence. If $2 \sum_{n=1}^{40} (P_n)^{\frac{1}{n}} = \frac{3^\alpha - 1}{3^\beta}$ and $\gcd(\alpha, \beta) = 1$, then $\alpha + \beta$ is equal to

[JEE Main 2026 (Online) 24th January Morning Shift]

- (1) 73 (2) 74 (3) 75 (4) 76

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- Q.6** Let $a_1, a_2, a_3, \dots$ be a G.P. of increasing positive terms such that $a_2 \cdot a_3 \cdot a_4 = 64$ and $a_1 + a_3 + a_5 = \frac{813}{7}$. Then $a_3 + a_5 + a_7$ is equal to :

[JEE Main 2026 (Online) 21st January Morning Shift]

- (1) 3256 (2) 3252 (3) 3248 (4) 3244

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- Q.7** Let $a_1, \frac{a_2}{2}, \frac{a_3}{2^2}, \dots, \frac{a_{10}}{2^9}$ be a G.P. of common ratio $\frac{1}{\sqrt{2}}$. If $a_1 + a_2 + \dots + a_{10} = 62$, then a_1 is equal to:

[JEE Main 2026 (Online) 21st January Evening Shift]

- (1) $\sqrt{2} - 1$ (2) $2(\sqrt{2} - 1)$
(3) $2 - \sqrt{2}$ (4) $2(2 - \sqrt{2})$

Scan or tap for the full solution



- Q.8** Let x_1, x_2, x_3, x_4 be in a geometric progression. If 2, 7, 9, 5 are subtracted respectively from x_1, x_2, x_3, x_4 , then the resulting numbers are in an arithmetic progression. Then the value of $\frac{1}{24}(x_1 x_2 x_3 x_4)$ is:

[JEE Main 2025 (Online) 7th April Morning Shift]

- (1) 18 (2) 216 (3) 36 (4) 72

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- Q.9** If the sum of the second, fourth and sixth terms of a G.P. of positive terms is 21 and the sum of its eighth, tenth and twelfth terms is 15309, then the sum of its first nine terms is :

[JEE Main 2025 (Online) 7th April Evening Shift]

- (1) 757 (2) 755 (3) 750 (4) 760

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- Q.10** Let $a_1, a_2, a_3, \dots$ be a G.P. of increasing positive numbers. If $a_3 a_5 = 729$ and $a_2 + a_4 = \frac{111}{4}$, then $24(a_1 + a_2 + a_3)$ is equal to

[JEE Main 2025 (Online) 3rd April Morning Shift]

- (1) 128 (2) 129 (3) 131 (4) 130

Scan or tap for the
full solution



Q.11 Let $\langle a_n \rangle$ be a sequence such that $a_0 = 0$, $a_1 = \frac{1}{2}$ and $2a_{n+2} = 5a_{n+1} - 3a_n$, $n = 0, 1, 2, 3, \dots$. Then $\sum_{k=1}^{100} a_k$ is equal to

[JEE Main 2025 (Online) 28th January Morning Shift]

- (1) $3a_{100} + 100$ (2) $3a_{100} - 100$
(3) $3a_{99} - 100$ (4) $3a_{99} + 100$

Scan or tap for the
full solution



Section B (Numerical)

Q.12 In a G.P., if the product of the first three terms is 27 and the set of all possible values for the sum of its first three terms is $R - (a, b)$, then $a^2 + b^2$ is equal to _____.

[JEE Main 2026 (Online) 28th January Morning Shift]

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full solution



Q.13 Suppose a, b, c are in A.P. and $a^2, 2b^2, c^2$ are in G.P. If $a < b < c$ and $a + b + c = 1$, then $9(a^2 + b^2 + c^2)$ is equal to _____.

[JEE Main 2026 (Online) 22nd January Evening Shift]

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full solution



ANSWER KEY

Section A (MCQ)

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	1	3	4	1	1	2	2	2	1	2	2

Section B (Numerical)

Ques.	12	13									
Ans.	90	9									