

Q1. JEE Main 2026 (21 January Shift 2)

The positive integer n , for which the solutions of the equation

$x(x+2) + (x+2)(x+4) + \dots + (x+2n-2)(x+2n) = \frac{8n}{3}$ are two consecutive even integers, is :

- (1) 3 (2) 12 (3) 9 (4) 6

Q2. JEE Main 2026 (21 January Shift 2)

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 :

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

Q3. JEE Main 2026 (28 January Shift 2)

Let the arithmetic mean of $\frac{1}{a}$ and $\frac{1}{b}$ be $\frac{5}{16}$, $a > 2$. If α is such that $a, 4, \alpha, b$ are in A.P., then the equation $\alpha x^2 - ax + 2(\alpha - 2b) = 0$ has:

- (1) one root in $(0, 2)$ and another in $(-4, -2)$
(2) one root in $(1, 4)$ and another in $(-2, 0)$
(3) both roots in the interval $(-2, 0)$
(4) complex roots of magnitude less than 2

Q4. JEE Main 2026 (28 January Shift 2)

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

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

Q5. JEE Main 2026 (28 January Shift 2)

If $\sum_{r=1}^{25} \left(\frac{r}{r^4 + r^2 + 1} \right) = \frac{p}{q}$, where p and q are positive integers such that $\gcd(p, q) = 1$, then $p + q$ is equal to _____.

Q6. JEE Main 2026 (24 January Shift 2)

Let a_1, a_2, a_3, a_4 be an A.P. of four terms such that each term of the A.P. and its common difference l are integers. If

$a_1 + a_2 + a_3 + a_4 = 48$ and $a_1 a_2 a_3 a_4 + l^4 = 361$, then the largest term of the A.P. is equal to

- (1) 23 (2) 21 (3) 27 (4) 24

Q7. JEE Main 2026 (24 January Shift 2)

$\left(\frac{1}{3} + \frac{4}{7} \right) + \left(\frac{1}{3^2} + \frac{1}{3} \times \frac{4}{7} + \frac{4^2}{7^2} \right) + \left(\frac{1}{3^3} + \frac{1}{3^2} \times \frac{4}{7} + \frac{1}{3} \times \frac{4^2}{7^2} + \frac{4^3}{7^3} \right) + \dots$ upto infinite terms, is equal to

- (1) $\frac{4}{3}$ (2) $\frac{6}{5}$ (3) $\frac{5}{2}$ (4) $\frac{7}{4}$

Q8. JEE Main 2026 (22 January Shift 2)

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 _____.

Q9. JEE Main 2026 (22 January Shift 1)

If the sum of the first four terms of an A.P. is 6 and the sum of its first six terms is 4, then the sum of its first twelve terms is

- (1) -22 (2) -24 (3) -20 (4) -26

Q10. JEE Main 2026 (23 January Shift 2)

Let $\sum_{k=1}^n a_k = \alpha n^2 + \beta n$. If $a_{10} = 59$ and $a_6 = 7a_1$, then $\alpha + \beta$ is equal to

- (1) 3 (2) 12 (3) 7 (4) 5

Q11. JEE Main 2026 (21 January Shift 1)

Let $a_1, a_2, a_3, \dots$ be 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 :

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

Q12. JEE Main 2026 (21 January Shift 1)

Let $a_1 = 1$ and for $n \geq 1$, $a_{n+1} = \frac{1}{2}a_n + \frac{n^2 - 2n - 1}{n^2(n+1)^2}$. Then $\left| \sum_{n=1}^{\infty} \left(a_n - \frac{2}{n^2} \right) \right|$ is equal to _____.

Q13. JEE Main 2026 (28 January Shift 1)

The common difference of the A.P.: $a_1, a_2, \dots, a_m$ is 13 more than the common difference of the A.P.: $b_1, b_2, \dots, b_n$. If $b_{31} = -277$, $b_{43} = -385$ and $a_{78} = 327$, then a_1 is equal to

- (1) 16 (2) 21 (3) 19 (4) 24

Q14. JEE Main 2026 (28 January Shift 1)

The value of $\sum_{k=1}^{\infty} (-1)^{k+1} \left(\frac{k(k+1)}{k!} \right)$ is

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

Q15. JEE Main 2026 (28 January Shift 1)

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 $\mathbb{R} - (a, b)$, then $a^2 + b^2$ is equal to _____.

Q16. JEE Main 2026 (24 January Shift 1)

Consider an A.P.: $a_1, a_2, \dots, a_n$; $a_1 > 0$. If $a_2 - a_1 = \frac{-3}{4}$, $a_n = \frac{1}{4}a_1$, and $\sum_{i=1}^n a_i = \frac{525}{2}$, then $\sum_{i=1}^{17} a_i$ is equal to

- (1) 136 (2) 476 (3) 238 (4) 952

Q17. JEE Main 2026 (24 January Shift 1)

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

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