

JEE MAIN 23 JANUARY 2025 SHIFT 2

MATHEMATICS QUESTION PAPER WITH ANSWER KEY

Q.No.	Questions	Answers
1	A square is divided in 4×4 squares. If two squares are chosen randomly then the probability that the squares doesn't share common side is	4/5
2	There are 5 boys and 4 girls. The sum of number of ways to sit them such that all boys together and number of ways such that no boys sit together is equal to	17280
3	Let $f(x) = 6 + 16\cos((\pi/3) - x)\cos((\pi/3) + x) * \cos x * \sin 3x * \cos 6x$ if range of $f(x)$ is $[\alpha, \beta]$, then distance of (α, β) from $3x + 4y + 12 = 0$ is	11
4	Consider the terms 8, 21, 34, 47,... 320. The variance of the given data set is	8788
5	Let M (1/2, 1) be the midpoint of a chord to the ellipse $x^2/2 + y^2/4 = 1$, then the length of the chord is	$2\sqrt{(5/3)}$
6	If the square of the shortest distance between the lines $(x - 2)/1 = (y - 1)/2 = (z + 3)/-3$ and $(x + 1)/2 = (y + 3)/4 = (z + 5)/-5$ is m/n (where m and n are coprime number) then $m + n = ?$	9
7	$A = \{(x, y) \mid x + y \geq 3\};$ $B = \{(x, y) \mid x + y \leq 3\}$ Let $C = A \cap B$. Find the sum of $x + y \forall x, y \in C$.	0
8	A rod of length 8 units having two end points always lie on $x - y + 2 = 0$ and $x + y + 2 = 0$. A point P divides this line in ratio 2: 1. Then locus of P is	$9x^2 + 9y^2$ $+36x - 28 = 0$
9	If system of linear equations $x + y + z = 6$ $x + 2y + 5z = 9$ $x + 5y + \lambda z = \mu$ has no solutions. Then value of λ equals to	17

10	Let S be the region consisting of points (x, y) such that $-1 \leq x \leq 1$ and $0 \leq y \leq \alpha + e x - e -x $. If the area bounded by the region is $2(e^2 + 8e + 1)/e$ square units, then find the value of α .	10
11	If z is a complex number such that $ z $ and $ z/\bar{z} + \bar{z}/z = 1$, then the number of complex number z is	8
12	Let (a, 0) be a point such that its shortest distance from the parabola $y^2 = 4x$ is 4. equation of the circle passing through (a, 0) and focus of the parabola having centre on the axis of the parabola is	$x^2 + y^2 - 6x + 5 = 0$
13	If 10th and 11th terms of an arithmetic progression are roots of equation $3x^2 - px + q = 0$ and the common difference of the arithmetic progression is $3/2$. Also, the sum of first 11 terms of the arithmetic progression is 88, then $q - 2p$ is	474