JEE ADVANCED MATHS SOLUTIONS

YEAR 2014

Ques No.	Question
1	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1** Let $f:(0,\infty)\overrightarrow{R}$ be given by $f(x) = \int_{\frac{1}{x}}^{x} \frac{e^{-\left(t+\frac{1}{t}\right)}dt}{t},$ then (a)$f(x)$ is monotonically increasing on $[1,\infty)$ (b)$f(x)$ is monotonically decreasing on $(0,1)$ (c)$f(2^x)$ is an odd function of x on R Watch Free Video Solution on Doubtnut
2	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1** Let $f:(0,\infty)\overrightarrow{R}$ be given by $f(x) = \int_{\frac{1}{x}}^{x} \frac{e^{-\left(t+\frac{1}{t}\right)}dt}{t},$ then (a)$f(x)$ is monotonically increasing on $[1,\infty)$ (b)$f(x)$ is monotonically decreasing on $(0,1)$ (c)$f(2^x)$ is an odd function of x on R Watch Free Video Solution on Doubtnut
3	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1** Late $a \in R$ and let $f: R \rightarrow$ be given by $f(x) = x^5 - 5x + a,$ then $f(x)$ has three real roots if $a > 4$ $f(x)$ has only one real roots if $a > 4$ $f(x)$ has three real roots if $a < -4$ $f(x)$ has three real roots if `-4 Watch Free Video Solution on Doubtnut

4	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1** Late $a \in R$ and let $f: R \rightarrow$ be given by $f(x) = x^5 - 5x$ $+ a,$ then $f(x)$ has three real roots if $a > 4$ $f(x)$ has only one real roots if $a > 4$ $f(x)$ has three real roots if $a < -4$ $f(x)$ has three real roots if `-4 Watch Free Video Solution on Doubtnut
5	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1** Six cards and six envelopes are numbered 1, 2, 3, 4, 5, 6 and cards are to be placed in envelopes so that each envelope contains exactly one card and no card is placed in the envelope bearing the same number and moreover cards numbered 1 is always placed in envelope numbered 2. Then the number of ways it can be done is a.264 b. 265 c. 53 d. 67 Watch Free Video Solution on Doubtnut
6	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1** For every pair of continuous functions $f, g: [0, 1] \rightarrow R$ such that $\max\{f(x): x$ $\in [0, 1]\} =$ $\max\{g(x): x$ $\in [0, 1]\}$ then which are the correct statements Watch Free Video Solution on Doubtnut
7	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1** A circle S passes through the point (0, 1) and is orthogonal to the circles $(x-1)^2 + y^2 = 16$ and $x^2 + y^2 = 1$. Then Watch Free Video Solution on Doubtnut

doubtnut पढ़ना हुआ आसान	
8	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1** A circle S passes through the point (0, 1) and is orthogonal to the circles $(x-1)^2+y^2=16$ and $x^2+y^2=1$. Then Watch Free Video Solution on Doubtnut
9	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1** Let x, y and z be three vectors each of magnitude V2 tion on and the angle between each pair of them is E. If a is a let non-zero vector perpendicular to x and yx z and b is a non-zero tor perpendicular to y and z x x, then 1. Watch Free Video Solution on Doubtnut
10	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1** From a point $P(\lambda, \lambda, \lambda)$, perpendicular PQ and PR are drawn respectively on the lines $y=x, z=1$ and $y=-x, z=-1$.If P is such that $\angle QPR$ is a right angle, then the possible value(s) of λ is/(are) Watch Free Video Solution on Doubtnut
11	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1** Let M be a 2×2 symmetric matrix with integer entries. Then M is invertible if The first column of M is the transpose of the second row of M The second row of M is the transpose of the first column of M M is a diagonal matrix with non-zero entries in the main diagonal The product of entries in the main diagonal of M is not the square of an integer Watch Free Video Solution on Doubtnut

12

JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1

Let $MandN$ be two 3×3 matrices such that $MN = NM$. Further, if
$M \neq N^2 andM^2$
$= N^4,$

then Determinant of $(M^2 + MN^2)$ is 0 There is a 3×3 non-zeero matrix U such tht $(M^2 + MN^2)U$ is the zero matrix Determinant of $(M^2 + MN^2) \geq 1$ For a 3×3 matrix
$U, \quad \text{if} \quad (M^2$
$+ MN^2)U$
equal the zero mattix then U is the zero matrix

Watch Free Video Solution on Doubtnut

13

JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1

Let $f\colon [a, b]\overrightarrow{1, \infty}$ be a continuous function and let $g\colon \overrightarrow{RR}$ be defined as `g(x)={0ifx bT h e ng(x)
$iscont \in uousbut$
$\neg d \Leftrightarrow erentiab$
$\leq ata$
g(x)
$isd \Leftrightarrow erentiab$
$\leq on$
Rg(x)
$iscont \in uousbut\nu td$
$\Leftrightarrow erentiab \leq at$
bg(x)

$isc ont \in uous$ and
$d \Leftrightarrow erentiab$
$\leq ateither$
a or b` but not both.

Watch Free Video Solution on Doubtnut

14

JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1

Let $f : \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)\vec{R}$ be given by
$f(x)$
$= (\log(\sec x$
$+ \tan x))^3$
then $f(x)$ is an odd function $f(x)$ is a one-one function $f(x)$ is an onto function $f(x)$ is an even function

Watch Free Video Solution on Doubtnut

15

JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1

Let $n \geq 2$ be integer. Take n distinct points on a circle and join each pair of points by a line segment. Color the line segment joining every pair of adjacent points by blue and the rest by red. If the number of red and blue line segments are equal, then the value of n is

Watch Free Video Solution on Doubtnut

JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1

Let
$f : R \rightarrow R$ and $g : R$
$\rightarrow R$
be respectively given by
$f(x) = |x| + 1$ and
$g(x) = x^2 + 1$
. Define $h : R \rightarrow R$ by

16	$h(x) = \{ \max \{f(x), g(x)\}, \text{ if } x \leq 0 \text{ and } \min \{f(x), g(x)\}, \text{ if } x > 0$ .The number of points at which $h(x)$ is not differentiable is Watch Free Video Solution on Doubtnut
17	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1** Let a,b ,c be positive integers such that $\frac{b}{a}$ is an integer. If a,b,c are in GP and the arithmetic mean of a,b,c, is b+2 then the value of $\frac{a^2+a-14}{a+1}$ is Watch Free Video Solution on Doubtnut
18	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1** Let $\vec{a}, \vec{b}, \text{ and } \vec{c}$ be three non coplanar unit vectors such that the angle between every pair of them is $\frac{\pi}{3}$. If $\vec{a} \times \vec{b} + \vec{b} \times \vec{x} = p\vec{a} + q\vec{b} + r\vec{c}$ where p,q,r are scalars then the value of $\frac{p^2+2q^2+r^2}{q^2}$ is Watch Free Video Solution on Doubtnut
19	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1** The slope of the tangent to the curve $(y-x^5)^2 = x(1+x^2)^2$ at the point $(1, 3)$ is. Watch Free Video Solution on Doubtnut

20

JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1

The value of

$$\int_0^1 4x^3\left\{\frac{d^2}{dx^2}(1-x^2)^5\right\}dx is$$

Watch Free Video Solution on Doubtnut

21

JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1

The largets value of non negative integer for which

$$\lim_{x\to 1}\left\{\frac{(-ax+\sin(x-1)+a]1-\sqrt{x}}{x+\sin(x-1)-1}\right\}^{\frac{1-x}{1-\sqrt{x}}}=\frac{1}{4}$$

Watch Free Video Solution on Doubtnut

22

JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 1

For a point P in the plane, let $d_1(P) and d_2(P)$ be the distances of the point P from the lines

$x-y=0 and x+y=0$

respectively. The area of the region R consisting of all points P lying in the first quadrant of the plane and satisfying

$2\leq d_1(P)+d_2(P)\leq 4,$

is

	Watch Free Video Solution on Doubtnut
23	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 2** Three boys and two girls stand in a queue. The probability, that the number of boys ahead is at least one more than the number of girls ahead of her, is Watch Free Video Solution on Doubtnut

24	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 2** In a triangle the sum of two sides is x and the product of the same is y. If $x^2 - c^2 = y$ where c is the third side. Determine the ration of the in-radius and circum-radius Watch Free Video Solution on Doubtnut
25	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 2** The common tangents to the circle $x^2 + y^2 = 2$ and the parabola $y^2 = 8x$ touch the circle at P, Q andthe parabola at R, S. Then area of quadrilateral $PQRS$ is Watch Free Video Solution on Doubtnut
26	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 2** The common tangents to the circle $x^2 + y^2 = 2$ and the parabola $y^2 = 8x$ touch the circle at P, Q andthe parabola at R, S. Then area of quadrilateral $PQRS$ is Watch Free Video Solution on Doubtnut
27	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 2** The quadratic equation $p(x) = 0$ with real coefficients has purely imaginary roots. Then the equation $p(p(x)) = 0$ has only purely imaginary roots at real roots two real and purely imaginary roots neither real nor purely imaginary roots

Watch Free Video Solution on Doubtnut

28

JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 2

The following integral $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} (2\cos ecx)^{17} dx$ is equal to

$(a) \int_0^{\log\left(1+\sqrt{2}\right)} 2\left(e^u + e^{-u}\right)^{16} du$

$(b) \int_0^{\log\left(1+\sqrt{2}\right)} 2\left(e^u + e^{-u}\right)^{17} du$

$(c) \int_0^{\log\left(1+\sqrt{2}\right)} 2\left(e^u - e^{-u}\right)^{17} du$

$(d) \int_0^{\log\left(1+\sqrt{2}\right)} 2\left(e^u - e^{-u}\right)^{16} du$

Watch Free Video Solution on Doubtnut

29

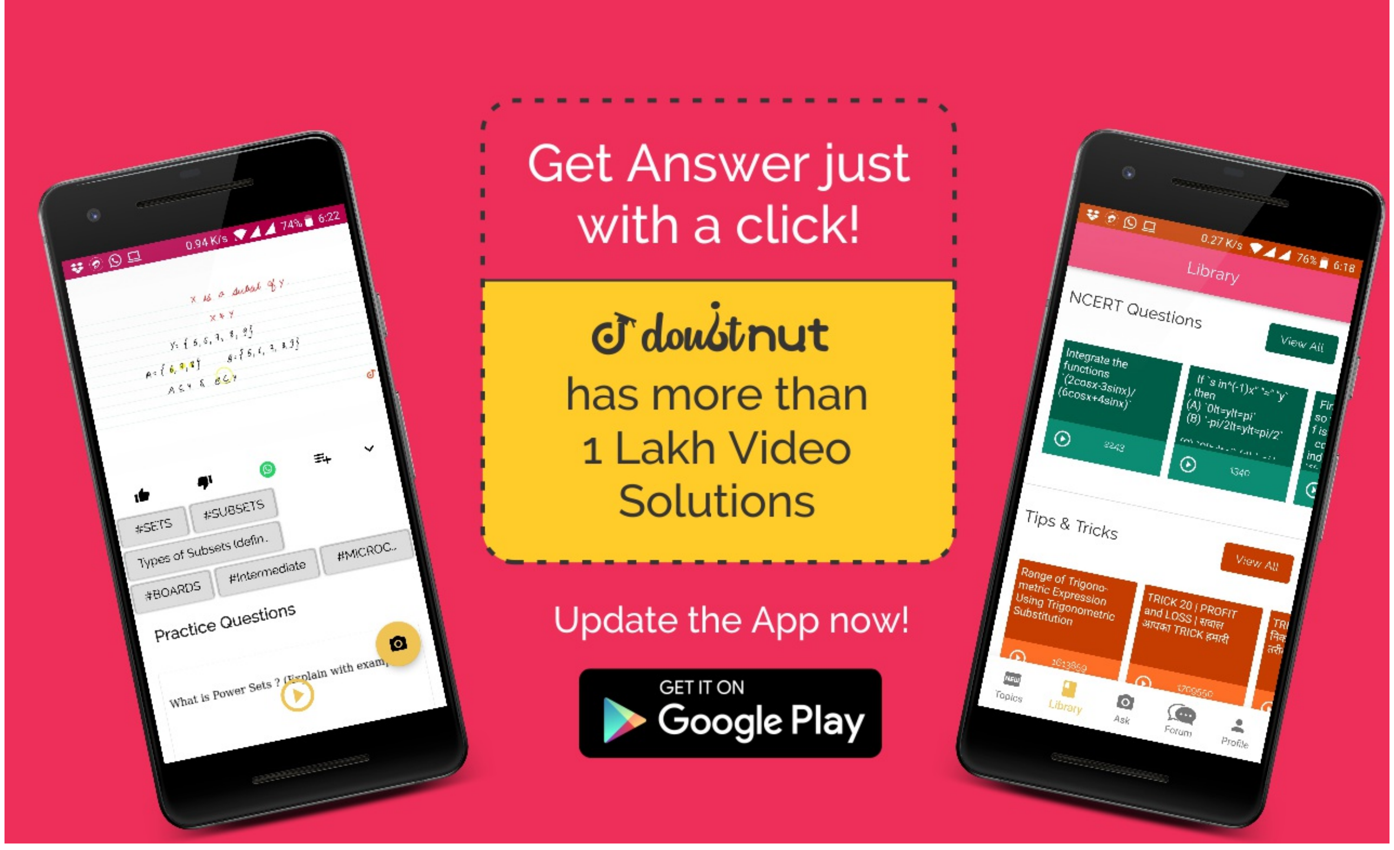
JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 2

The function $y = f(x)$ is the solution of the differential equation $\frac{dy}{dx} + \frac{xy}{x^2 - 1} = \frac{x^4 + 2x}{\sqrt{1 - x^2}}$ in $(-1, 1)$ satisfying $f(0) = 0$. Then $\int_{\frac{\sqrt{3}}{2}}^{\frac{\sqrt{3}}{2}} f(x) dx$ is

	Watch Free Video Solution on Doubtnut
30	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 2** Let $f:[0,2]\to R$ be a function which is continuous on [0,2] and is differentiable on (0,2) with $f(0)=1$ $Let: F(x) =$ $\int_0^{x^2} f(\sqrt{t})dt f \text{ or } x$ $\in [0,2]\dot{I} f F'(x)$ $= f'(x)$. for all $x\in(0,2)$, then $F(2)$ equals (a)e^2-1 (b) e^4-1 (c)$e-1$ (d) e^4 Watch Free Video Solution on Doubtnut
31	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 2** Coefficient of x^{11} in the expansion of $(1+x^2)^4(1$ $+x^3)^7(1+x^4)^{12}$ is 1051 b. 1106 c. 1113 d. 1120 Watch Free Video Solution on Doubtnut

32	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 2** For $x\in(0,\pi)$, the equation $\sin x + 2s \in x$ $-\sin 3x = 3$ has infinitely many solutions three solutions one solution no solution Watch Free Video Solution on Doubtnut

33	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 2** Box 1 contains three cards bearing numbers 1, 2, 3; box 2 contains five cards bearing numbers 1, 2, 3,4, 5; and box 3 contains seven cards bearing numbers 1, 2, 3, 4, 5, 6, 7. A card is drawn from each of the boxes. Let x_i be the number on the card drawn from the ith box, i = 1, 2, 3. The probability that $x_1 + x_2 + x_3$ is odd is The probability that x_1, x_2, x_3 are in an aritmetic progression is Watch Free Video Solution on Doubtnut
34	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 2** Box 1 contains three cards bearing numbers 1, 2, 3; box 2 contains five cards bearing numbers 1, 2, 3,4, 5; and box 3 contains seven cards bearing numbers 1, 2, 3, 4, 5, 6, 7. A card is drawn from each of the boxes. Let x_i be the number on the card drawn from the ith box, i = 1, 2, 3. The probability that $x_1 + x_2 + x_3$ is odd is The probability that x_1, x_2, x_3 are in an aritmetic progression is Watch Free Video Solution on Doubtnut
35	**JEE ADVANCED MATHS SOLUTIONS - 2014 || Paper 2** Let $z_k = \cos\left(2k\frac{\pi}{10}\right) + i\sin\left(2k\frac{\pi}{10}\right); k = 1, 2, 34, ..., 9$ (A) For each z_k there exists a z_j such that $z_k . z_j = 1$ (ii) there exists a $k \in \{1, 2, 3, ..., 9\}$ such that $z_1 z = z_k$ Watch Free Video Solution on Doubtnut


Get Answer just with a click!
doubtnut
has more than 1 Lakh Video Solutions
Update the App now!
GET IT ON
Google Play
Practice Questions
Library
NCERT Questions
Tips & Tricks