JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1

MATHS

MEMORY BASED

Ques No.	Question
1 - 9525801	**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 - MEMORY BASED - MATHS** Number of 6 digits number divisible by 11 made by using the digits 0.1,2,5,7 and 9 without repetition is equal to (A) 55 (B) 60 (C) 62 (D) 120 **CORRECT OPTION: B** Watch Free Video Solution on Doubtnut
2 - 9525802	**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -**

MEMORY BASED - MATHS

Let $\triangle 1 = \begin{vmatrix} x & \sin\theta & \cos\theta \\ -\sin\theta & x & 1 \\ \cos\theta & 1 & x \end{vmatrix}$ and $\triangle 2 = \begin{vmatrix} x & \sin 2\theta & \cos 2\theta \\ -\sin 2\theta & x & 1 \\ \cos 2\theta & 1 & x \end{vmatrix}$ then which of following is/are true?

(A) $\triangle 1 - \triangle 2 = x^3$

(B) $\triangle 1 + \triangle 2 + 2x^3$

(C) $\triangle 1 + \triangle 2 = x^3$

(D) $\triangle 1 - \triangle 2 = 2x^3$

CORRECT OPTION: B

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3 - 9525803

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Let numbers $a_1, a_2 \ldots a_{16}$ are in AP and $a_1 + a_4 + a_7 + a_{10} + a_{13} + a_{16} = 114$ then $a_1 + a_5 + a_{12} + a_{16}$ is equal to

(A) 36

(B) 96

(C) 76

(D) 38

CORRECT OPTION: C

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4 - 9525804

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In the expansion of $\left(1 + ax + bx^2\right)(1 - 3x)^{15}$, if coefficient of x^2 and x^3 is 0 then ordered pair (a, b) is equal to

(A) $(28, 325)$

(B) $(18, 315)$

(C) $(28, 315)$

(D) $(18, 325)$

CORRECT OPTION: C

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5 - 9525805

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Let $z = \frac{(1+i)^2}{a-i}, (a > 0)$ and $|z| = \sqrt{\frac{2}{5}}$ then z is equal to

(A) $-\frac{1}{5} - \frac{3i}{5}$

(B) $\frac{1}{5} + \frac{3i}{5}$

(C) $\frac{3}{5} - \frac{1}{5}i$

(D) $-\frac{3}{5} + \frac{i}{5}$

CORRECT OPTION: A

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6 - 9525806

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Let $\lim_{x \to 1} \frac{x^4 - 1}{x - 1} = \lim_{k \to k} \frac{x^3 - k^3}{x^2 - k^2}$ then value of k is

(A) $\frac{2}{3}$

(B) $\frac{3}{2}$

(C) $\frac{4}{3}$

(D) $\frac{8}{3}$

CORRECT OPTION: D

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Value of $\lim_{n \to \infty} \frac{(n+1)^{1/3} + (n+2)^{1/3} + \ldots + (2n)^{1/3}}{n^{4/3}}$ is equal to

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(A) $\frac{1}{4}\left(2^{1/4} - 1\right)$

(B) $\frac{3}{4}\left(2^{1/4} - 1\right)$

(C) $\frac{3}{4}\left(2^{4/3} - 1\right)$

(D) $\frac{3}{4}\left(2^{4/3} + 1\right)$

CORRECT OPTION: C

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8 - 9525808

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if y(x) is satisfy the differential equation $\frac{dy}{dx} = (\tan x - y)\sec^2 x$ and $y(0) = 0$. Then $y = \left(-\frac{\pi}{4}\right)$ is equal to

(A) $(e - 2)$

(B) $(2e - 1)$

(C) $\left(e^2 - 1\right)$

(D) $(e + 2)$

CORRECT OPTION: A

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9 - 9525809

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If α and β are roots of the equation $x^2 + \sin\theta . x - 2\sin\theta = 0$ then $\frac{a^{12} + \beta^{12}}{(a^{-12} + \beta^{-12})(\alpha - \beta)^{24}}$ is equal to

(A) $\frac{2^{24}}{(8 + \sin\theta)^{12}}$

(B) $\frac{2^{12}}{(8 + \sin\theta)^{12}}$

(C) $\frac{2^{12}}{(8 - \sin\theta)^{12}}$

(D) $\frac{1}{2^{24}}$

CORRECT OPTION: B

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From point $P(\beta, 0, \beta)$, where $(\beta \neq 0)$ A perpendicular is drawn on line $\frac{x}{1} = \frac{y-1}{0} = \frac{z+1}{-1}$ If length of perpendicular is $\sqrt{\frac{3}{2}}$ then value of β is

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(A) -1

(B) -2

(C) 1

(D) 2

CORRECT OPTION: A

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11 - 9525812

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Circle is tangent to the line $y = x$ at the point $P(1, 1)$ and poses through point $(1, -3)$ find the radius of the circle

(A) $\sqrt{2}$

(B) $2\sqrt{2}$

(C) $\frac{1}{\sqrt{2}}$

(D) $3\sqrt{2}$

CORRECT OPTION: B

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12 - 9525813

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If common chord of cicles $x^2 + y^2 + 5kx + 2y + k = 0$ and $x^2 + y^2 + kx + \frac{y}{2} + \frac{1}{2} = 0$ is $4x - 5y - k = 0$ then number of values of k is

(A) 0

(B) 1

(C) 2

(D) 3

CORRECT OPTION: C

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13 - 9525814

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Region formed by $|x - y| \leq 2$ and $|x + y| \leq 2$ is

(A) Rhombus of side is 2

(B) Square of area is 16

(C) Rhombus of area is $8\sqrt{2}$

(D) Square of side is $2\sqrt{2}$

CORRECT OPTION:

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if $f(x) = \begin{cases} \frac{\sin(p+1)x + \sin x}{x} & x < 0 \\ x & x = 0 \\ \frac{\sqrt{x^2+x} - \sqrt{x}}{x^{3/2}} & x > 0 \end{cases}$ is continuous at $x = 0$ then (p, q) is

(A) $\left(-\frac{1}{2}, -\frac{3}{2}\right)$

(B) $\left(\frac{3}{2}, \frac{1}{2}\right)$

(C) $\left(\frac{1}{2}, \frac{3}{2}\right)$

(D) $\left(-\frac{3}{2}, \frac{1}{2}\right)$

CORRECT OPTION: D

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15 - 9525816

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There are two family each having two children. If there are at least two girls amont ht children, find the probability that all children are girls

(A) $\frac{1}{9}$

(B) $\frac{1}{10}$

(C) $\frac{1}{11}$

(D) $\frac{1}{12}$

CORRECT OPTION: C

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There are three points A, B and C horizontal plane, such that $AB = AC = 100$m a varticaly tower is placed on the midpoint of BC, such that angle of elevation of the top of the tower from A is $\cot^{-1}\left(3\sqrt{2}\right)$ and that from B is $\operatorname{cosec}^{-1}\left(2\sqrt{2}\right)$ then the height of the tower is

(A) 25

(B) 10

(C) $\frac{100}{\sqrt{3}}$

(D) 20

CORRECT OPTION: D

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if

$$\int \frac{dx}{(x^2-2x+10)^2} = A\left(\tan^{-1}\left(\frac{x-1}{3}\right) + \frac{f(x)}{x^2-2x+10}\right)$$

then find A and f(x).

(A) $A = \frac{1}{54}, f(x) = 3(x-1)$

(B) $A = \frac{1}{54}, f(x) = 9(x-1)^2$

(C) $A = \frac{1}{27}, f(x) = 9(x-1)^2$

(D) $A = \frac{1}{81}, f(x) = 3(x-1)$

CORRECT OPTION: A

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18 - 9525819

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If equation of tangent to ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ at $\left(3, \frac{-9}{2}\right)$ is $x - 2y = 12$. Then length of latus rectum is

(A) 9

(B) $2\sqrt{2}$

(C) $3\sqrt{2}$

(D) $2\sqrt{3}$

CORRECT OPTION: A

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Marks	2	3	5	7
No . of students	$(x+1)^2$	$2x-5$	x^2-3x	x

The marks of 20 students in an examination are given in the following table. Average marks of these student is:

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(A) 2.6

(B) 2.7

(C) 2.8

(D) 2.9

CORRECT OPTION: C

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MEMORY BASED - MATHS

If $f(x) = e^x - x$ and $g(x) = x^2 - x$. The the interval in which fog(x) is increasing is

(A) $(0, 1/2) \cup (1, \infty)$

(B) $(-1/2, 0) \cup (1, \infty)$

(C) $(-1, \infty)$

(D) $(-1/2, 0)$

CORRECT OPTION: A

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A hyperbola has center at origin and passing through $\left(4 - 2\sqrt{3}\right)$ and having directrix $5x = 4\sqrt{5}$ then eccentricity of hyperbola (e) satisfy the equation.

(A) $4e^4 - 24e^2 + 35 = 0$

(B) $4e^4 + 24e^2 - 35 = 0$

(C) $4e^4 - 24e^2 - 35 = 0$

(D) $4e^4 + 24e^2 + 35 = 0$

CORRECT OPTION: A

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Let $S = 3 + \frac{5\left(1^3 + 2^3\right)}{1^2 + 2^2} + \frac{7\left(1^3 + 2^3 + 3^3\right)}{1^2 + 2^2 + 3^2} + \ldots$ then the sum up to 10 terms is

(A) 220

(B) 660

(C) 330

(D) 1320

CORRECT OPTION: B

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$f(x) = x^2, x \in R$

$S \in [0, 4]$

$g(A) = \{x : x \in R, f(x) \in A\}$ where $A \subset R$

which one is incorrect (where $P \subset Q$ means P is subset of Q)

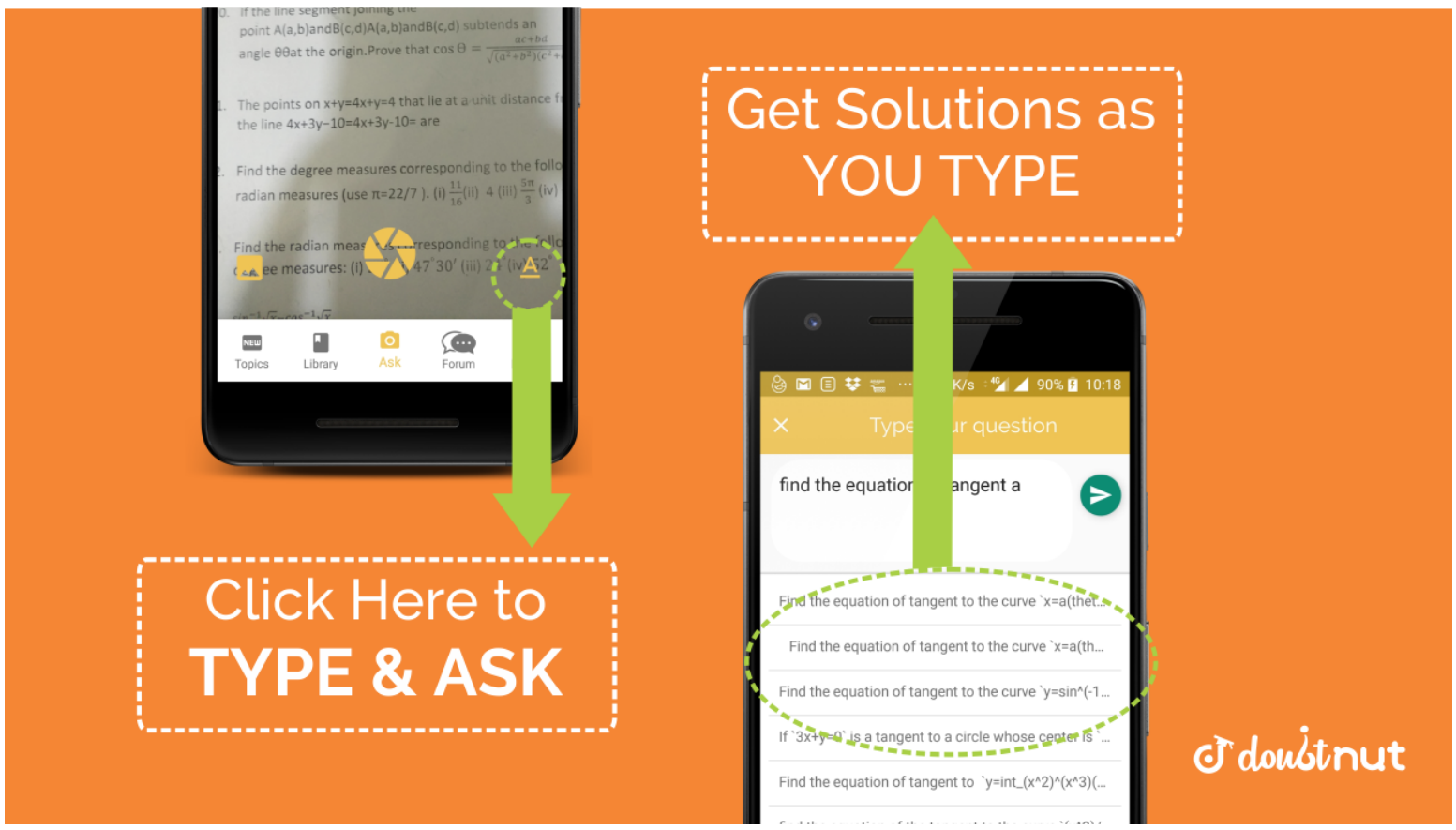
(A) $f(g(s)) \neq f(s)$

(B) $f(g(s)) = s$

(C) $g(f(s)) = g(s)$

(D) $g(f(s)) \neq s$

CORRECT OPTION: C



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let (i)

$(p \vee q) \wedge (p \vee \sim q), (ii)(p \wedge q) \wedge (q \vee \sim q), (iii)$

$. (p \vee q) \wedge (p \vee \sim q), (iv)(p \vee q) \vee (p \wedge \sim q)$

then which one is tautology

(A) (i)

(B) (ii)

(C) (iii)

(D) (iv)

CORRECT OPTION: A

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25 - 9525826

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Value of $\int_0^{2\pi} [\sin 2x(1+\cos 3x)]dx$ (where [.] denotes greatest integer fucntion)

(A) -2π

(B) π

(C) 2π

(D) $-\pi$

CORRECT OPTION: D

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Let the equations $x+y+z=5, x+2y+2z=6, x+3y+\lambda z=\mu$ have infinite solutions then the value of $\lambda+\mu$ is

(A) 7

(B) 10

(C) 11

(D) $1/2$

CORRECT OPTION: B

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A $(3, 0, -1)$, $B(2, 10, 6)$ and $(1, 2, 1)$ are the vertices of a triangle. M is the mid point of the line segment joining AC and G is a point on line segment BM dividing $2:1$ ratio internally find $\cos(\angle GOA)$

(A) $\frac{2}{\sqrt{5}}$

(B) $\frac{1}{\sqrt{15}}$

(C) $\frac{1}{\sqrt{10}}$

(D) $\frac{1}{\sqrt{3}}$

CORRECT OPTION: B

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28 - 9525830

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Given a point $P(0, -1, -3)$ and the image of P in the plane $3 - y + 4z - 2 = 0$ is Q. Point R is $(3, -1, -2)$ find the area of $\triangle PQR$

(A) $\frac{\sqrt{91}}{13}$

(B) $\frac{\sqrt{91}}{2}$

(C) $\sqrt{\frac{91}{2}}$

(D) $\sqrt{91}$

CORRECT OPTION: B

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29 - 9525831

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if $\frac{2\sqrt{\sin^2 x - 2\sin x + 5}}{4^{\sin^2 y}} \leq 1$ then which option is correct.

(A) $2\sin x = \sin y$

(B) $|\sin x| = \sin y$

(C) $\sin x = |\sin y|$

(D) $\sin x = 2\sin y$

CORRECT OPTION: C

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A function f(x) is differentiable at $x = c(c \in R)$. Let $g(x) = |f(x)|$, $f(c) = 0$ then

(A) g(x) is not differentiable at $x = c$

(B) for g(x) to be differentiable at c, $f'(c) = 0$

(C) for g(x) to be non-differentiable at c, $f'(c) = 0$

(D) none of these

CORRECT OPTION: B

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