

Ques No.

Question

**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

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**CORRECT OPTION: B**

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2 - 9525802

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## MEMORY BASED - MATHS

Let  $\Delta 1 = \begin{vmatrix} x & \sin \theta & \cos \theta \\ -\sin \theta & x & 1 \\ \cos \theta & 1 & x \end{vmatrix}$  and

$\Delta 2 = \begin{vmatrix} x & \sin 2\theta & \cos 2\theta \\ -\sin 2\theta & x & 1 \\ \cos 2\theta & 1 & x \end{vmatrix}$  then which of

following is/are true?

- (A)  $\Delta 1 - \Delta 2 = x^3$
- (B)  $\Delta 1 + \Delta 2 + 2x^3$
- (C)  $\Delta 1 + \Delta 2 = x^3$
- (D)  $\Delta 1 - \Delta 2 = 2x^3$

**CORRECT OPTION: B**

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Let numbers  $a_1, a_2, \dots, a_{16}$  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

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**CORRECT OPTION: C**

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**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -  
MEMORY BASED - MATHS**

In the expansion of  $(1 + ax + bx^2)(1 - 3x)^{15}$ , 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)

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**CORRECT OPTION: C**

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**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -  
MEMORY BASED - MATHS**

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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**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -  
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Let  $\lim_{x \rightarrow 1} \frac{x^4 - 1}{x - 1} = \lim_{k \rightarrow k} \frac{x^3 - k^3}{x^2 - k^2}$  then value of k is

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

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

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

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

**CORRECT OPTION: D**

**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -  
MEMORY BASED - MATHS**

Value

of

$$\lim_{n \rightarrow \infty} \frac{(n+1)^{1/3} + (n+2)^{1/3} + \dots + (2n)^{1/3}}{n^{4/3}}$$

is

equal to

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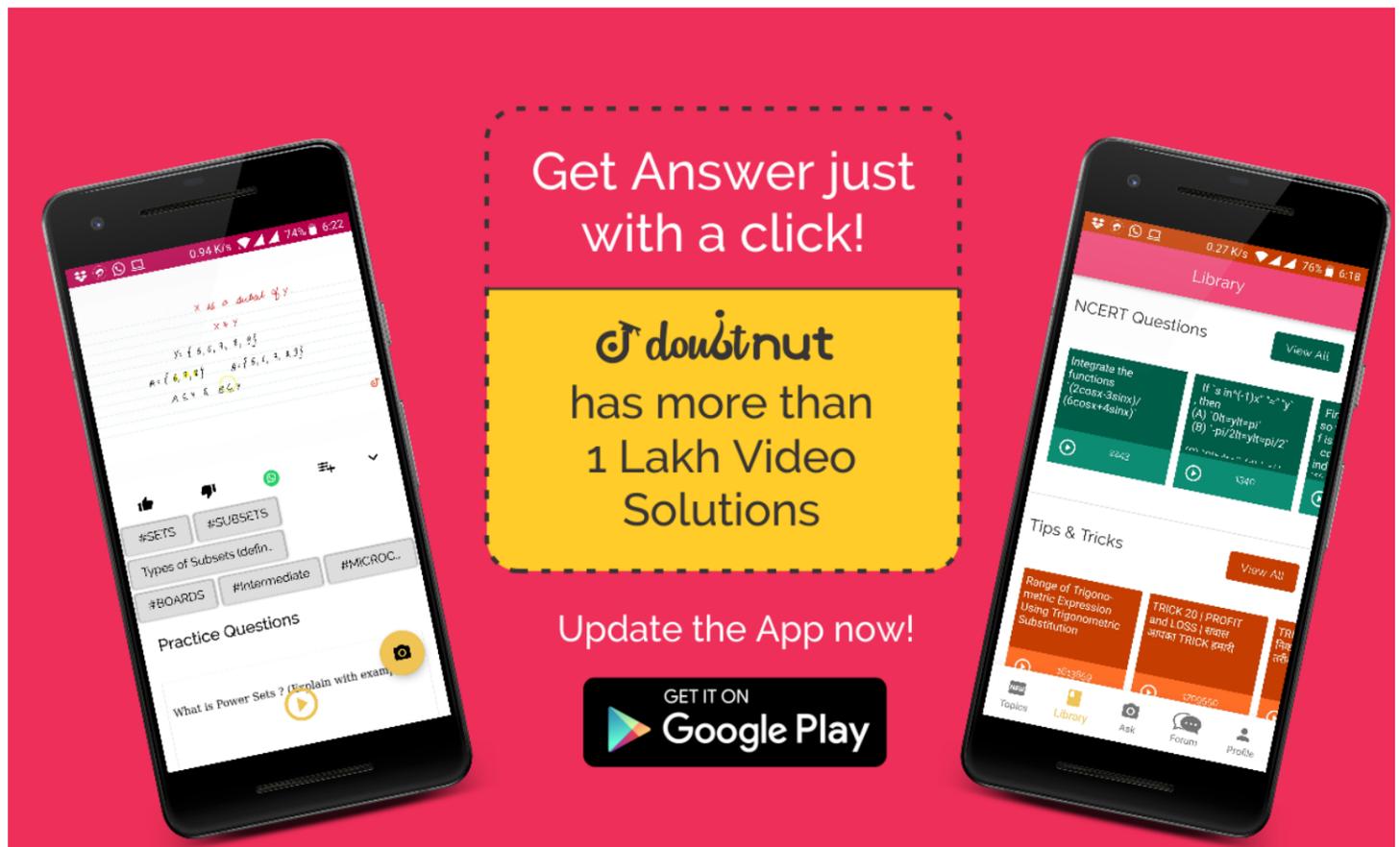
(A)  $\frac{1}{4} (2^{1/4} - 1)$

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

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

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

**CORRECT OPTION: C**



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## JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 - MEMORY BASED - MATHS

if  $y(x)$  is satisfy the differential equation

$$\frac{dy}{dx} = (\tan x - y)\sec^2 x \quad \text{and} \quad y(0) = 0. \quad \text{Then}$$

$$y = \left( -\frac{\pi}{4} \right) \text{ is equal to}$$

(A)  $(e - 2)$

(B)  $(2e - 1)$

(C)  $(e^2 - 1)$

(D)  $(e + 2)$

**CORRECT OPTION: A**

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**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -  
MEMORY BASED - MATHS**

If  $\alpha$  and  $\beta$  are roots of the equation

$$x^2 + \sin \theta \cdot x - 2 \sin \theta = 0 \quad \text{then}$$

$$\frac{\alpha^{12} + \beta^{12}}{(a^{-12} + \beta^{-12})(\alpha - \beta)^{24}} \text{ is equal to}$$

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

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**CORRECT OPTION: B**

**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -  
MEMORY BASED - MATHS**

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  $\beta$  is

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(A)  $-1$

(B)  $-2$

(C)  $1$

(D)  $2$

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**CORRECT OPTION: A**

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**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -  
MEMORY BASED - MATHS**

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

(A)  $\sqrt{2}$

(B)  $2\sqrt{2}$

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

(D)  $3\sqrt{2}$

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**CORRECT OPTION: B**

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**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -  
MEMORY BASED - MATHS**

If common chord of circles  $x^2 + y^2 + 5kx + 2y + k = 0$

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

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**CORRECT OPTION: C**

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**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -  
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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  $2\sqrt{2}$

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## CORRECT OPTION:

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## JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 - MEMORY BASED - MATHS

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

$x = 0$  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)  $\left(-\frac{3}{2}, \frac{1}{2}\right)$

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## CORRECT OPTION: D

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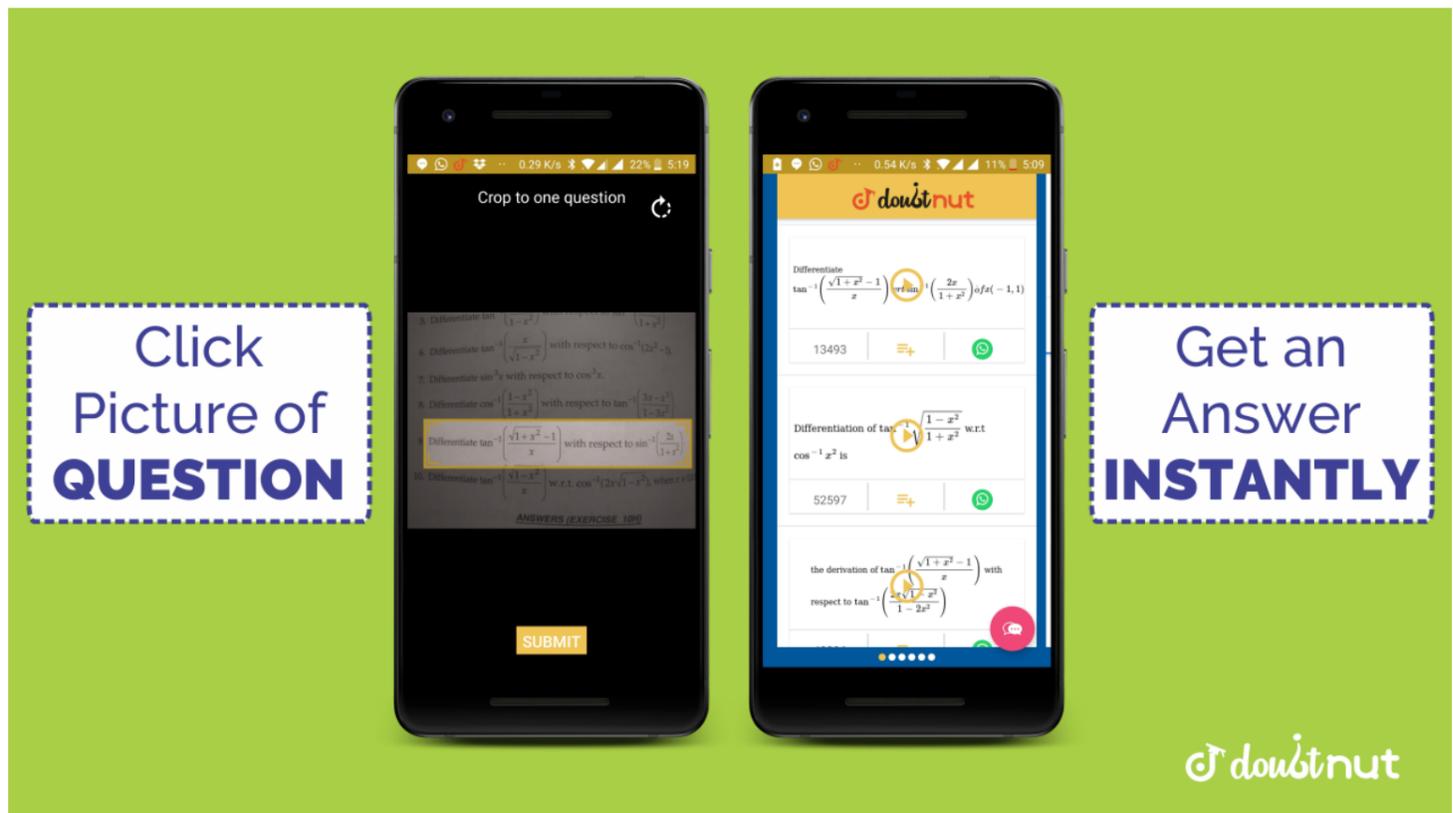
There are two family each having two children. If there are at least two girls among the children, find the probability that all children are girls

- (A)  $\frac{1}{9}$   
(B)  $\frac{1}{10}$   
(C)  $\frac{1}{11}$   
(D)  $\frac{1}{12}$

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**CORRECT OPTION: C**

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**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 - MEMORY BASED - MATHS**

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

- (A) 25
- (B) 10

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

(D) 20

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**CORRECT OPTION: D**

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**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -  
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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)  $A = \frac{1}{54}, f(x) = 9(x - 1)^2$

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

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

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**CORRECT OPTION: A**

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**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -  
MEMORY BASED - MATHS**

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)  $2\sqrt{3}$

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**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**

20 - 9525821

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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)  $(-1/2, 0)$

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**CORRECT OPTION: A**

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## JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 - MEMORY BASED - MATHS

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

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

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

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

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

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**CORRECT OPTION: A**

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MEMORY BASED - MATHS**

Let  $S = 3 + \frac{5(1^3 + 2^3)}{1^2 + 2^2} + \frac{7(1^3 + 2^3 + 3^3)}{1^2 + 2^2 + 3^2} + \dots$  then

the sum up to 10 terms is

(A) 220

(B) 660

(C) 330

(D) 1320

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**CORRECT OPTION: B**

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**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -  
MEMORY BASED - MATHS**

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

$$S \in [0, 4]$$

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

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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The advertisement features an orange background. On the left, a smartphone displays a math problem: "If the line segment joining the point A(a,b) and B(c,d) subtends an angle  $\theta$  at the origin. Prove that  $\cos \theta = \frac{ac+bd}{\sqrt{(a^2+b^2)(c^2+d^2)}}$ ". Below the phone is a dashed box with the text "Click Here to TYPE & ASK" and a green arrow pointing to the phone. On the right, another smartphone shows the app's search interface with the text "Type your question" and "find the equation of tangent a". A dashed box above it says "Get Solutions as YOU TYPE" with a green arrow pointing to the search bar. The Doubtnut logo is in the bottom right corner.

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**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -  
MEMORY BASED - MATHS**

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)

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**CORRECT OPTION: A**

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**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -  
MEMORY BASED - MATHS**

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

(A)  $-2\pi$

(B)  $\pi$

(C)  $2\pi$

(D)  $-\pi$

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**CORRECT OPTION: D**

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**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -  
MEMORY BASED - MATHS**

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)  $1/2$

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**CORRECT OPTION: B**

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MEMORY BASED - MATHS**

$A(3, 0, -1)$ ,  $B(2, 10, 6)$  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  $\cos(\angle GOA)$

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- (A)  $\frac{2}{\sqrt{5}}$   
(B)  $\frac{1}{\sqrt{15}}$   
(C)  $\frac{1}{\sqrt{10}}$   
(D)  $\frac{1}{\sqrt{3}}$

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**CORRECT OPTION: B**

**JEE MAINS 10 APRIL 2019 - PAPER 1 SHIFT 1 -  
MEMORY BASED - MATHS**

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)  $\sqrt{91}$

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**CORRECT OPTION: B**

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MEMORY BASED - MATHS**

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)  $\sin x = 2\sin y$

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**CORRECT OPTION: C**

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MEMORY BASED - MATHS**

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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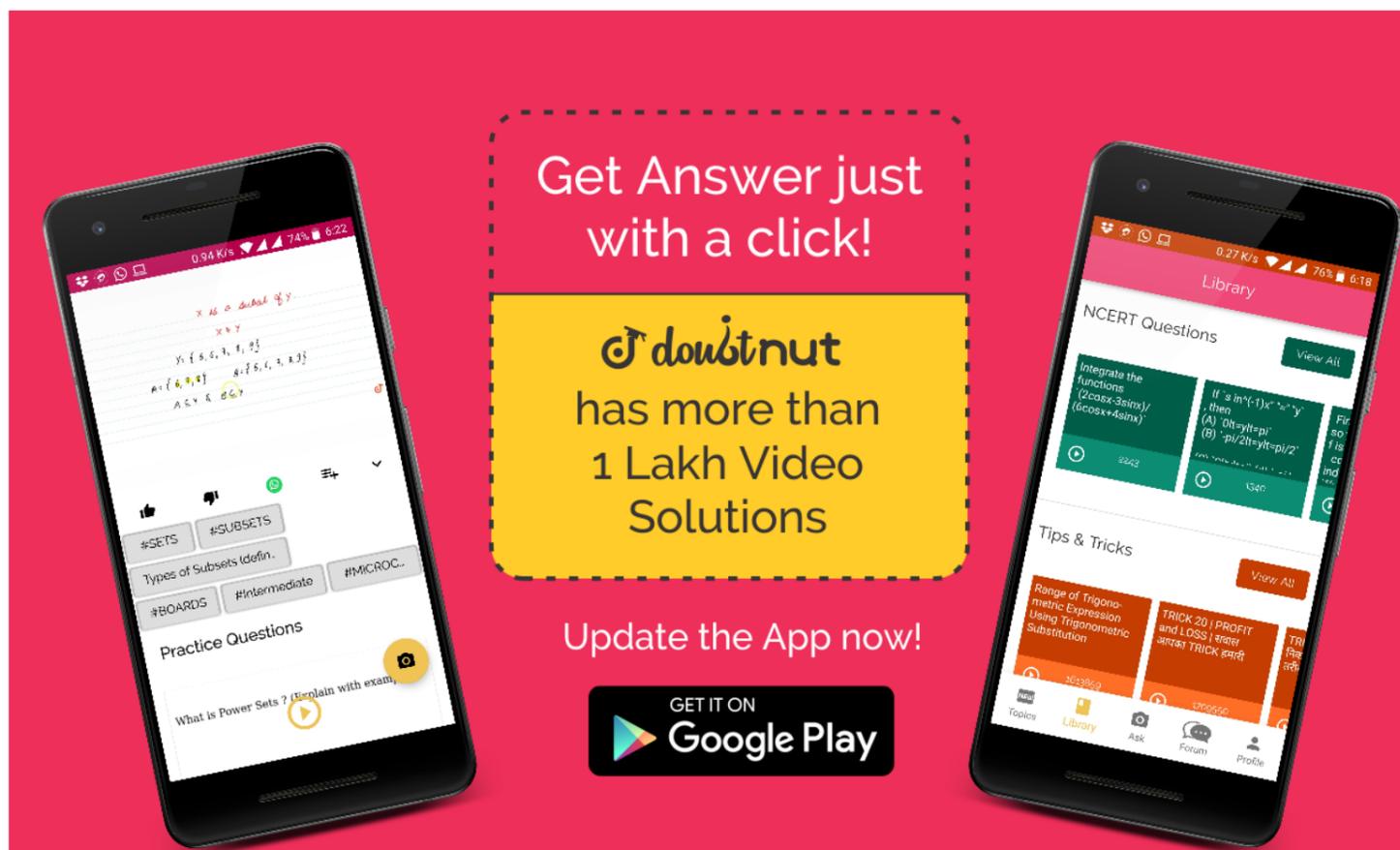
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