

Ques No.

Question

**JEE MAINS 12 APRIL 2019 - PAPER 1 SHIFT 2 -  
MEMORY BASED - MATHS**

if  $\int_{\alpha}^{\alpha+1} \frac{dx}{(x+\alpha)(x+\alpha+1)} = \log_e \left( \frac{9}{8} \right)$  then

number of values of  $\alpha$  is

(A) 2

(B) 3

(C) 4

(D) 6

**CORRECT OPTION: A**[Watch Free Video Solution on Doubtnut](#)

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## MEMORY BASED - MATHS

A team of three persons with at least one boy and at least one girl is to be formed from 5 boys and  $n$  girls. If the number of such teams is 1750, then the value of  $n$  is

(A) 24

(B) 28

(C) 27

(D) 25

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**CORRECT OPTION: D**

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MEMORY BASED - MATHS**

Two fair dice are thrown simultaneously. If both die show the same number, then the person wins Rs 15. If the sum of

number is 9, he wins Rs 12. In all other cases, he loses Rs.

6 Then the expectation is

(A) Rs 2 gain

(B) Rs  $\frac{1}{2}$  gain

(C) Rs  $\frac{1}{2}$  loss

(D) Rs 2 loss

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**CORRECT OPTION: C**

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**JEE MAINS 12 APRIL 2019 - PAPER 1 SHIFT 2 -  
MEMORY BASED - MATHS**

if  $\alpha, \beta, \gamma$  are non-constant terms in G.P. and equations

$\alpha x^2 + 2\beta x + \gamma = 0$  and  $x^2 + x - 1 = 0$  has a common

root then  $(\gamma - \alpha) \cdot \beta$  is

(A)  $\alpha\beta$

(B)  $\beta\gamma$

(C)  $\gamma\alpha$

(D) 0

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**CORRECT OPTION: C**

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**JEE MAINS 12 APRIL 2019 - PAPER 1 SHIFT 2 -  
MEMORY BASED - MATHS**

if

$$\int \frac{\tan x - \tan \alpha}{\tan x + \tan \alpha} dx = f(x) \cdot \cos 2\alpha + g(x) \cdot \sin 2\alpha + c$$

then  $f(x)$  and  $g(x)$  respectively. Are

(A)  $x, \ln \sin(x + \alpha)$

(B)  $\cos 2x, \ln \sin(x + 2\alpha)$

(C)  $\cos 2x, -\ln \sin(x + \alpha)$

(D)  $x, -\ln \sin(x + \alpha)$

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**CORRECT OPTION: D**

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**JEE MAINS 12 APRIL 2019 - PAPER 1 SHIFT 2 -  
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Negation of the statement  $p \rightarrow (p \vee \sim q)$  is

(A)  $p \vee q$

(B)  $p \wedge q$

(C)  $f$

(D)  $t$

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**CORRECT OPTION: C**

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if  $a_1, a_2, \dots, a_n$  are in A.P with  $a_1 + a_7 + a_{16} = 40$ .

Then the volume of  $a_1 + a_2 + \dots + a_{15}$  is

(A) 260

(B) 240

(C) 200

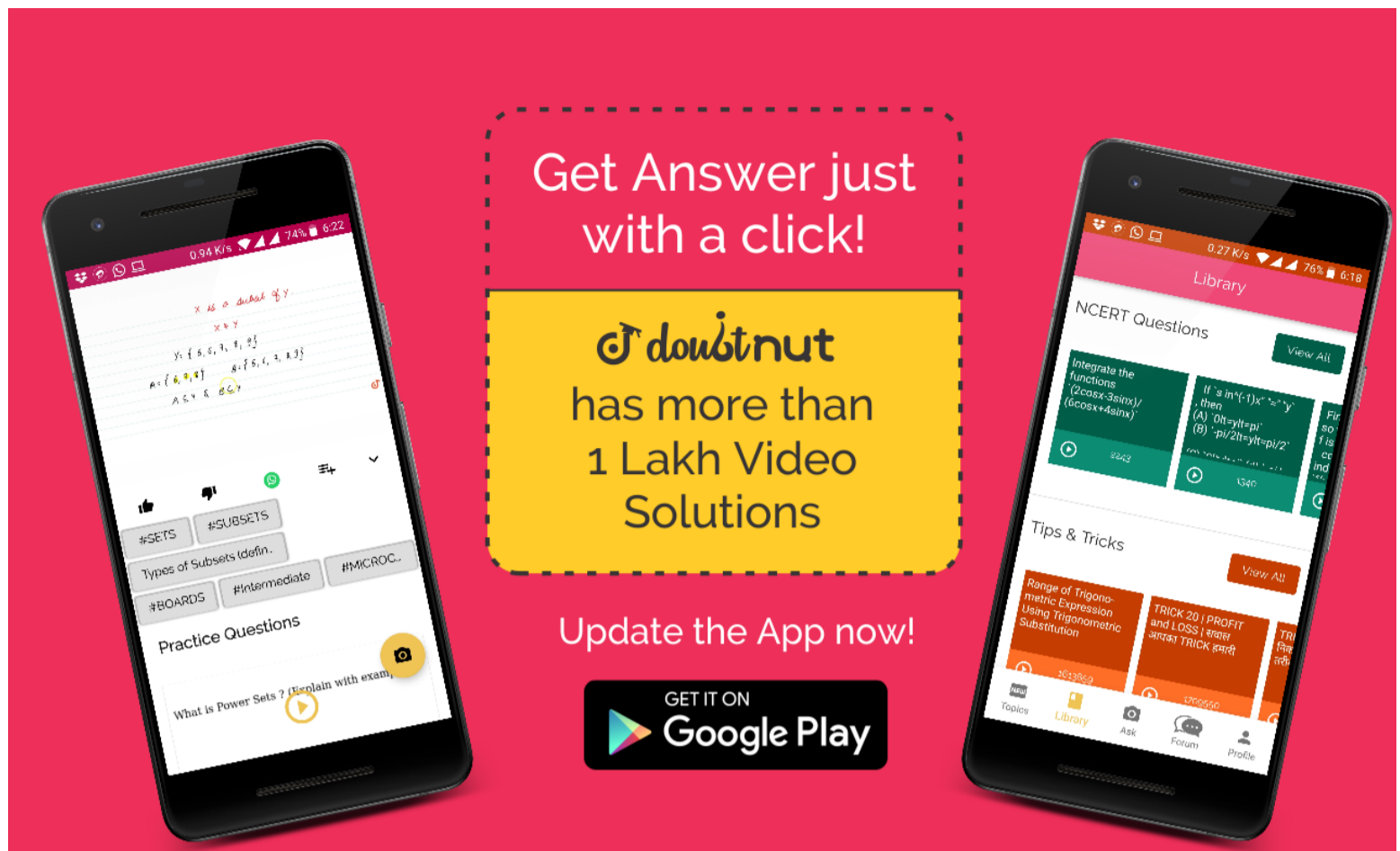
(D) 160

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**CORRECT OPTION: C**

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## JEE MAINS 12 APRIL 2019 - PAPER 1 SHIFT 2 - MEMORY BASED - MATHS

Then angle of elevation of a top of tower (point B) from a point A on ground at horizontal distance  $d$  from foot of the tower is  $45^\circ$ . Angle of elevation from a point C 30m vertically above point A is  $30^\circ$  then the value of  $d$  is

- (A)  $15(\sqrt{3} + 1)$
- (B)  $15(3 + \sqrt{3})$
- (C)  $30(\sqrt{3} - 1)$
- (D)  $30(3 + \sqrt{3})$

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**CORRECT OPTION: B**

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**JEE MAINS 12 APRIL 2019 - PAPER 1 SHIFT 2 -  
MEMORY BASED - MATHS**

Solution of the differential equation is

$$(y^2 - x^3)dx - xydy = 0 \text{ is}$$

$$(A) y^2 + 2x^3 + cx^2 = 0$$

$$(B) y^2 - 2x^2 + cx^2 = 0$$

$$(C) y^2 + 2x^3 - cx^2 = 0$$

$$(D) y^2 + 2x^2 + cx^3 = 0$$

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**CORRECT OPTION: A**

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## MEMORY BASED - MATHS

if the area enclosed by the curves  $y^2 = 4\lambda x$  and  $y = \lambda x$  is  $\frac{1}{9}$  square units then value of  $\lambda$  is

(A) 24

(B) 37

(C) 48

(D) 38

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**CORRECT OPTION: A**

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**JEE MAINS 12 APRIL 2019 - PAPER 1 SHIFT 2 -  
MEMORY BASED - MATHS**

The value of

$1^1 \cdot {}^{20}C_1 + 2^2 \cdot {}^{20}C_2 + 3^3 \cdot {}^{20}C_3 + \dots + (20)^{20} \cdot {}^{20}C_{20}$  is

(A)  $210 \times 2^{17}$

(B)  $420 \times 2^{17}$

(C)  $420 \times 2^{18}$

(D)  $210 \times 2^{18}$

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**CORRECT OPTION: C**

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**JEE MAINS 12 APRIL 2019 - PAPER 1 SHIFT 2 -  
MEMORY BASED - MATHS**

if  $\frac{2z - n}{2z + n} = 2i - 1, n \in N \in N$  and  $IM(z) = 10,$

then

(A)  $n = 20, Re(z) = 10$

(B)  $n = 20, Re(z) = -10$

(C)  $n = 40, Re(z) = 10$

(D)  $n = 40, Re(z) = -10$

**CORRECT OPTION: B**

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**JEE MAINS 12 APRIL 2019 - PAPER 1 SHIFT 2 -  
MEMORY BASED - MATHS**

The differentiation of  $\tan^{-1}\left(\frac{\tan x + 1}{\tan x - 1}\right)$  where  
 $x \in \left(0, \frac{\pi}{4}\right)$  with respect  $\frac{x}{2}$  is

(A) 2

(B) 1

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

(D)  $-2$

**CORRECT OPTION: D**

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**JEE MAINS 12 APRIL 2019 - PAPER 1 SHIFT 2 -  
MEMORY BASED - MATHS**

There are 50 questions in an exam. A student's probability that he is unable to correctly answer less than 2 questions

(A)  $\frac{201}{5} (415)^{50}$

(B)  $\frac{201}{5} \left(\frac{1}{5}\right)^{50}$

(C)  $\frac{201}{5} \left(\frac{1}{5}\right)^{49}$

(D)  $\frac{201}{5} \left(\frac{4}{5}\right)^{49}$

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**CORRECT OPTION: C**

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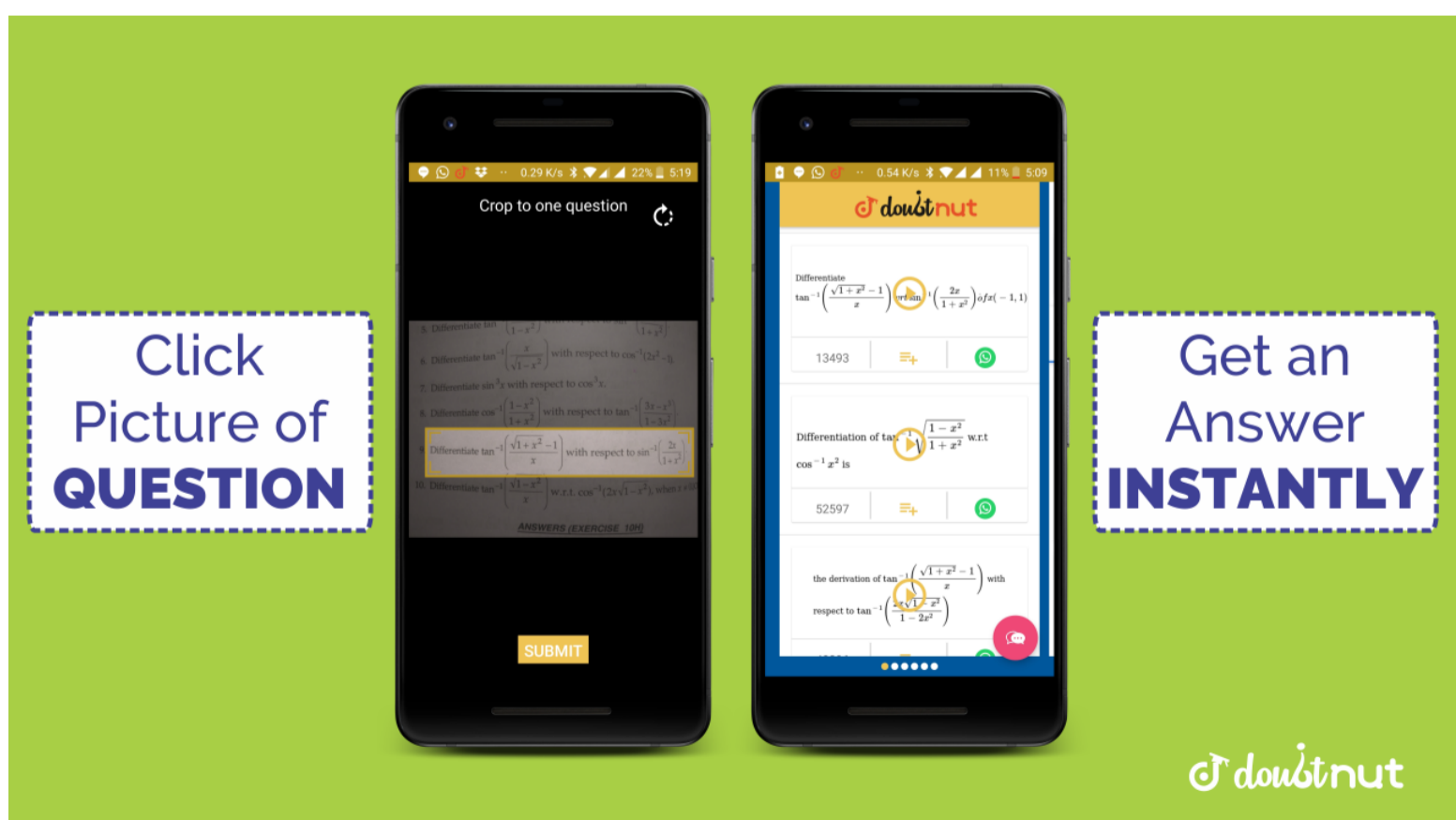
An ellipse with focii  $(0, \pm 2)$  has length of minor axis as 4 units. Then the ellipse will pass through the point

- (A)  $(2, \sqrt{2})$
- (B)  $(\sqrt{2}, 2)$
- (C)  $(2, 2\sqrt{2})$
- (D)  $(2\sqrt{2}, 2)$

**CORRECT OPTION: A**


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## MEMORY BASED - MATHS

The equation of common tangent to the curves  $y^2 = 16x$  and  $xy = -4$  is

- (A)  $y = x + 4$
- (B)  $2x - y + 8 = 0$
- (C)  $x+y=4$
- (D)  $2x + y + 4 = 0$

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**CORRECT OPTION: A**

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MEMORY BASED - MATHS**

If  $[-\sin \theta]y = 0$  and  $[\cot \theta]x + y = 0$  where  $[\ ]$  denotes greatest integer function. Then which of the following is correct

(A) Infinite solution is  $\left(\frac{\pi}{2}, \frac{2\pi}{3}\right)$  and a unique solution in  $\left(\pi, \frac{7\pi}{6}\right)$

(B) Unique solution in  $\left(\frac{\pi}{2}, \frac{2\pi}{3}\right)$  and infinite solutions in  $\left(\pi, \frac{7\pi}{6}\right)$

(C) Unique solution is  $\left(\frac{\pi}{2}, \frac{2\pi}{3}\right)$  and unique solution in  $\left(\pi, \frac{7\pi}{6}\right)$

(D) Infinite solution in  $\left(\frac{\pi}{2}, \frac{2\pi}{3}\right)$  and infinite solutions in  $\left(\pi, \frac{7\pi}{6}\right)$

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**CORRECT OPTION: C**

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Value

of

$$\lim_{x \rightarrow 0} \left( \frac{x + 2\sin x}{\sqrt{x^2 + 2\sin x + 1}} - \sqrt{x - \sin^2 x + 1} \right) \text{ is}$$

(A) 2

(B) 1

(C) 6

(D) -2

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**CORRECT OPTION: C**

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**JEE MAINS 12 APRIL 2019 - PAPER 1 SHIFT 2 -  
MEMORY BASED - MATHS**

1a  $A \cap B \subseteq C$  and  $A \cap B \neq \phi$ . Then which of the  
following is incorrect

(A)  $(A \cup B) \cap C \neq \phi$



(B)  $B \cup C = \phi$

(C)  $A \cup C \neq \phi$

(D) If  $(A - B) \subseteq C$ , then  $A \subseteq C$

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**CORRECT OPTION: B**

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**JEE MAINS 12 APRIL 2019 - PAPER 1 SHIFT 2 -  
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Let  $f(x) = 5 - [x - 2]$   $g(x) = [x + 1] + 3$  If maximum value of  $f(x)$  is  $\alpha$  & minimum value of  $f(x)$  is  $\beta$  then

$$\lim_{x \rightarrow (\alpha - \beta)} \frac{(x - 3)(x^2 - 5x + 6)}{(x - 1)(x^2 - 6x + 8)} \text{ is}$$

(A)  $-\frac{1}{2}$

(B)  $\frac{1}{2}$

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

(D)  $-\frac{3}{2}$

**CORRECT OPTION: A**

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If 
$$\begin{vmatrix} 1 + \cos^2 \theta & \sin^2 \theta & 4 \cos 6\theta \\ \cos^2 \theta & 1 + \sin^2 \theta & 4 \cos 6\theta \\ \cos^2 \theta & \sin^2 \theta & 1 + 4 \cos 6\theta \end{vmatrix} = 0, \quad \text{and}$$
$$\theta \in \left(0, \frac{\pi}{2}\right),$$
 then value of  $\theta$  is

- (A)  $\frac{7\pi}{36}$
- (B)  $\frac{7\pi}{24}$
- (C)  $\frac{\pi}{9}$
- (D)  $\frac{\pi}{4}$

**CORRECT OPTION: C**

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MEMORY BASED - MATHS**

A circle touches  $x$  – axis at point  $(3, 0)$ . If it makes an intercept of 8 units on  $y$  – axis, then the circle passes through which point

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- (A)  $(3, 1)$
- (B)  $(5, 2)$
- (C)  $(10, 3)$
- (D)  $(3, 10)$

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**CORRECT OPTION: D**

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A line is at a distance of 4 units from origin and having both intercepts positive. If the perpendicular from the origin to this line makes an angle of  $60^\circ$  with the line  $x + y = 0$ .

Then the equation of the line is

(A)  $(\sqrt{3} + 1)x + (\sqrt{3} - 1)y = 8\sqrt{2}$

(B)  $(\sqrt{3} - 1)x + (\sqrt{3} + 1)y = 8\sqrt{2}$

(C)  $(\sqrt{3} - 2)x + (\sqrt{3} + 2)y = 8\sqrt{2}$

(D)  $(\sqrt{3} + 2)x + (\sqrt{3} - 2)y = 8\sqrt{2}$

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**CORRECT OPTION: B**

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## JEE MAINS 12 APRIL 2019 - PAPER 1 SHIFT 2 - MEMORY BASED - MATHS

If the equation  $\cos 2x + \alpha \sin x = 2\alpha - 7$  has a solution.

Then range of  $\alpha$  is

- (A)  $[2, 6]$
- (B)  $[-2, 6]$
- (C)  $[-6, -2]$
- (D) None of these

**CORRECT OPTION: A**

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MEMORY BASED - MATHS**

if a line  $x - y = 3$  intersects the parabola  $y = (x - 2)^2 - 1$  at A and B and tangents at A and B meet again at point C. Then coordinates of point C is

- (A)  $\left(-\frac{5}{2}, 1\right)$   
(B)  $\left(-\frac{5}{2}, 1\right)$   
(C)  $\left(\frac{5}{2}, -1\right)$   
(D)  $\left(\frac{5}{2}, 1\right)$

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**CORRECT OPTION: C**

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26 - 9677791

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MEMORY BASED - MATHS**

A triangle having a vertex as  $(1, 2)$  has mid-point of sides passing from this vertex as  $(-1, 1)$  and  $(2, 3)$  then the centroid of the triangle is

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

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

(C)  $(1, 1)$

(D)  $\left(\frac{1}{3}, 4\right)$

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**CORRECT OPTION: A**

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**JEE MAINS 12 APRIL 2019 - PAPER 1 SHIFT 2 - MEMORY BASED - MATHS**

The term independent of  $x$  in

$\left(\frac{1}{60} - \frac{x^8}{81}\right) \left(2x^2 - \frac{3}{x^2}\right)^6$  is

(A)  $-36$

(B)  $36$

(C)  $72$

(D)  $108$

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**CORRECT OPTION: A**

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The point lying on angle bisector of the planes

$x + 2y + 2z - 6 = 0$  and  $2x - y + 2z + 4 = 0$  is

(A)  $(2, 4, 0)$

(B)  $(-1, 3, 2)$



(C)  $(-1, -3, 2)$

(D)  $(-2, 4, 0)$

**CORRECT OPTION: C**

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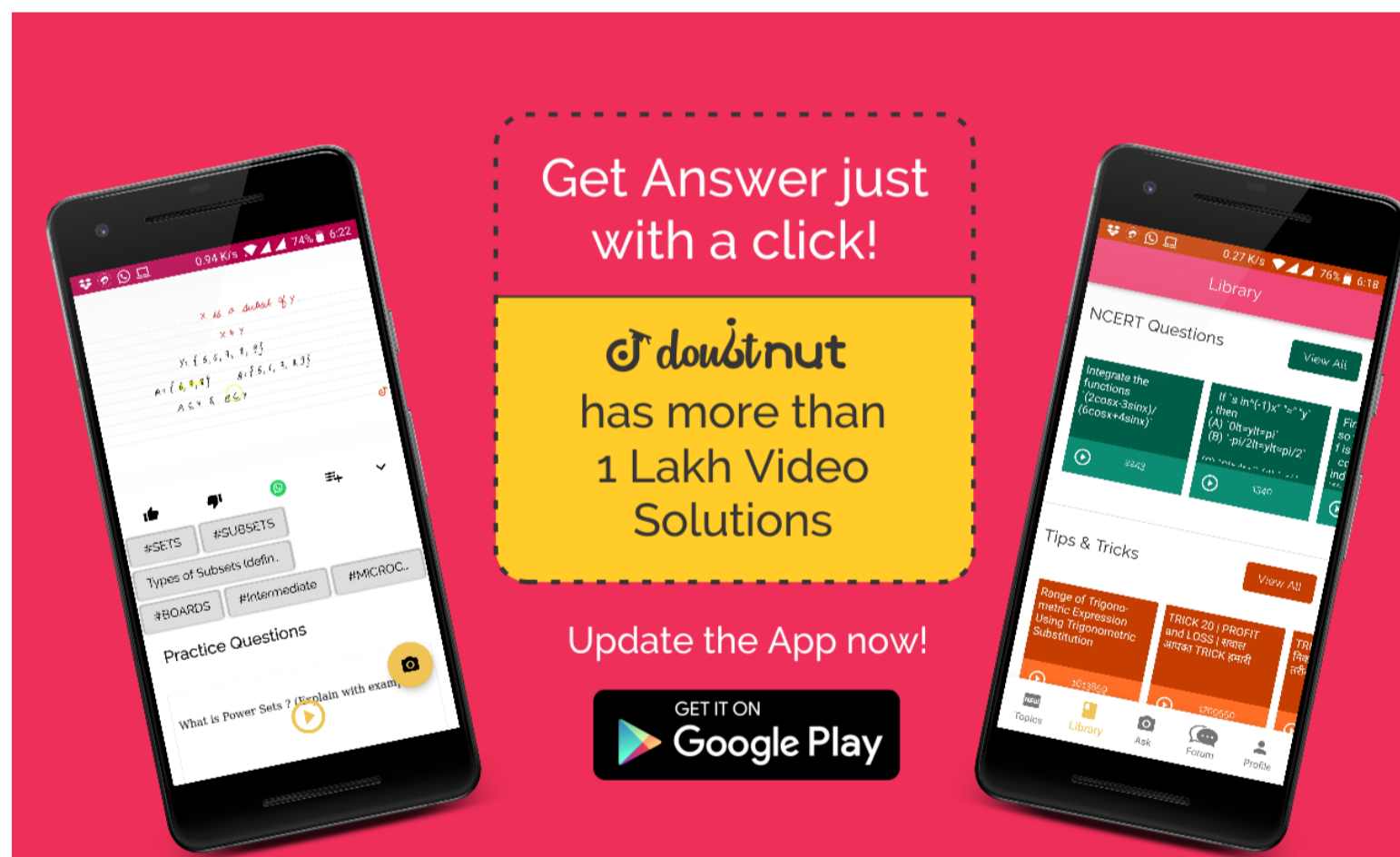
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