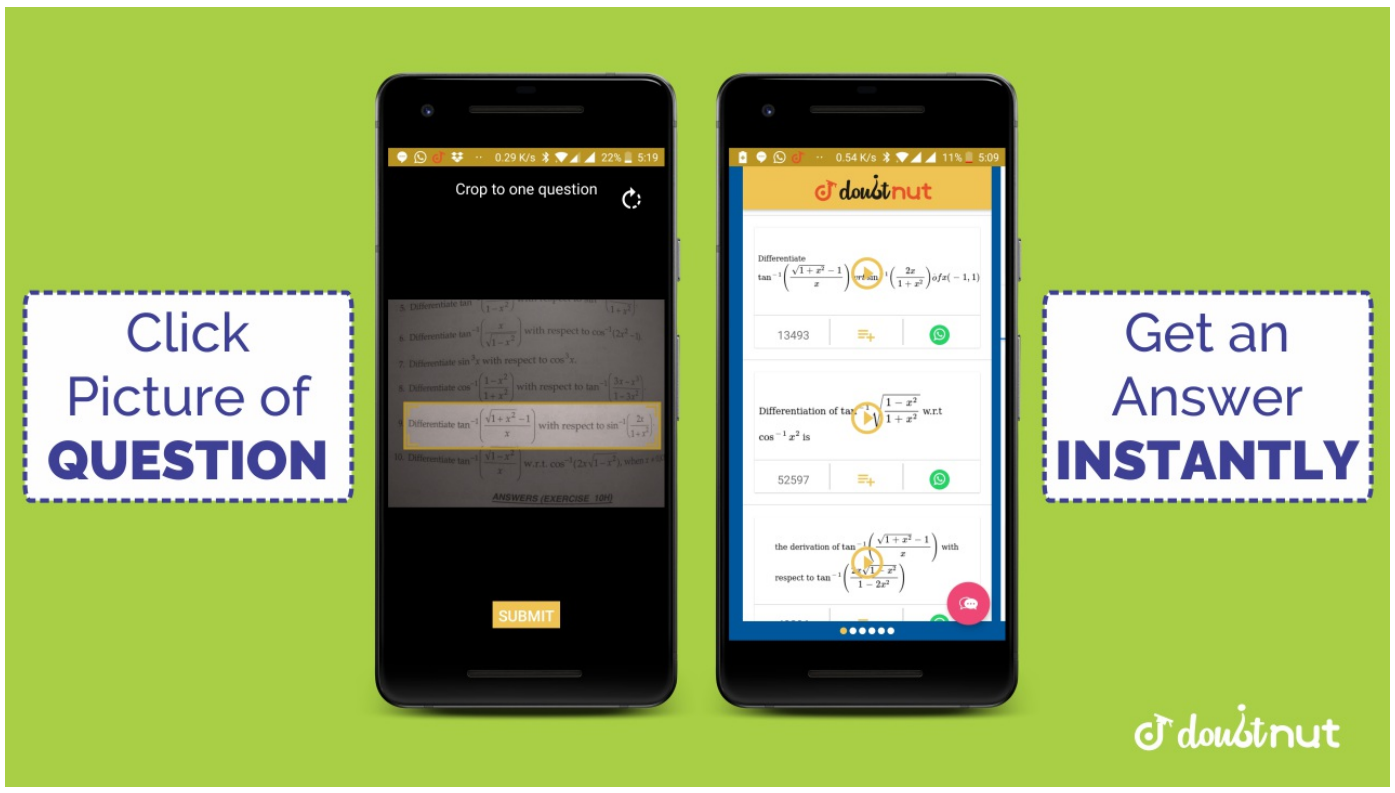
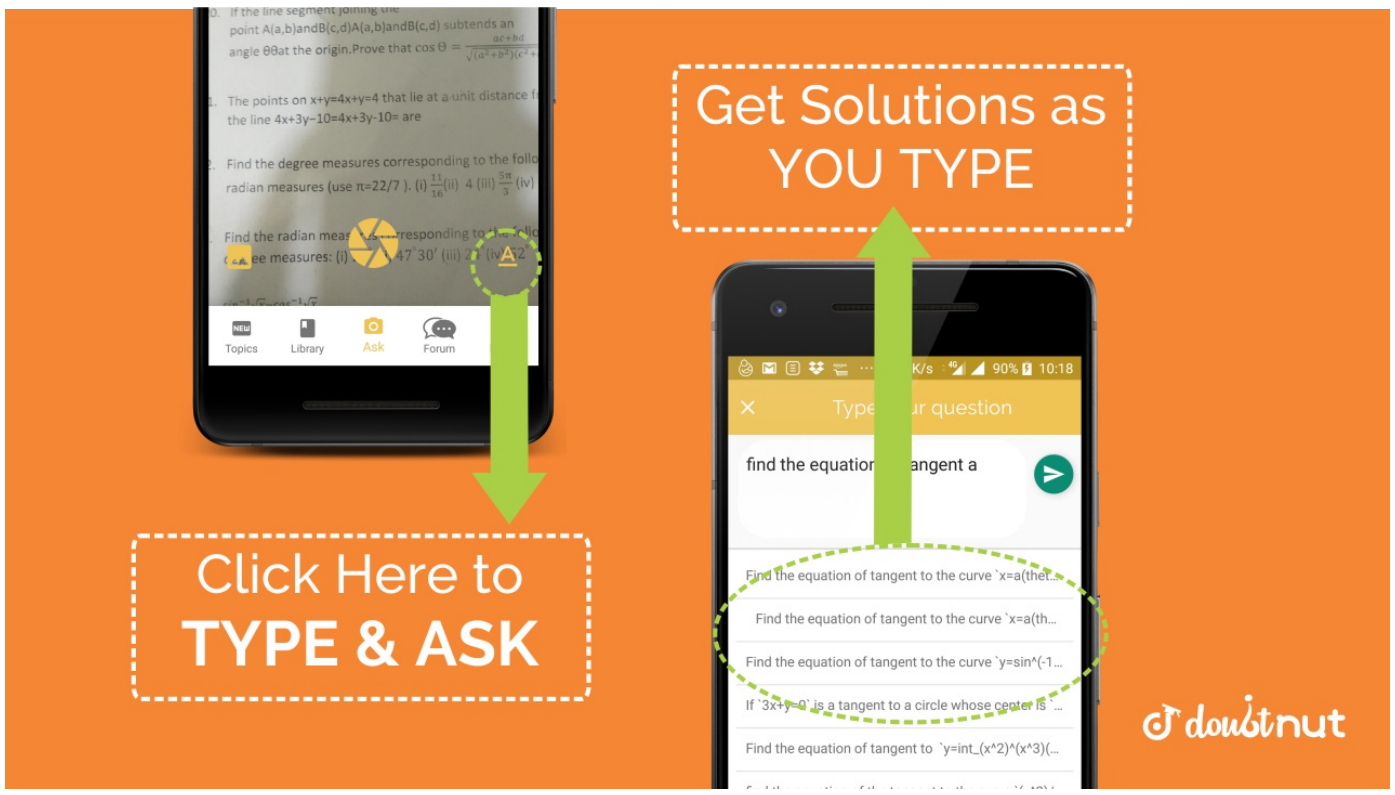
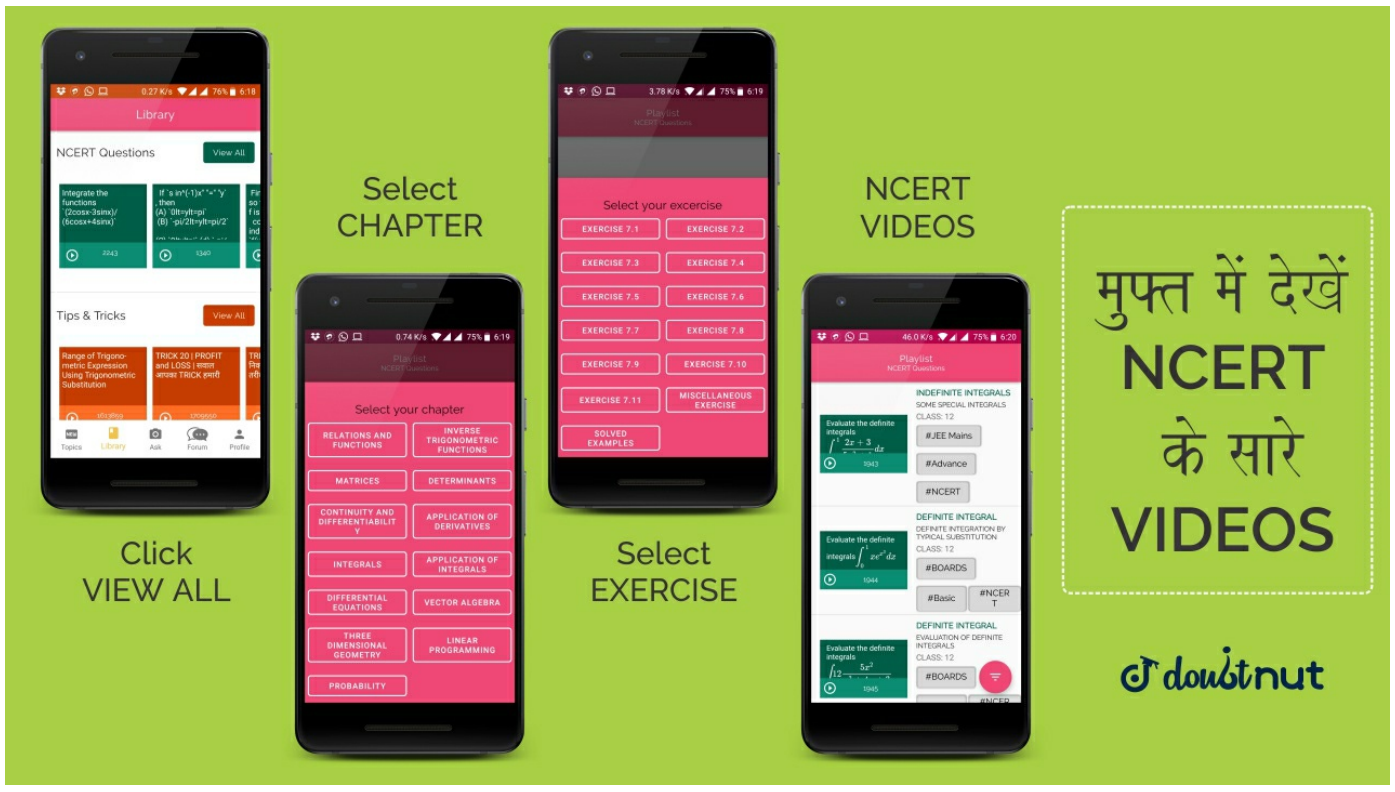
CLASS 12 BOARDS MATHS SOLUTIONS

YEAR 2014

Ques No.	Question
1	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Let * $R \cdot R \rightarrow$ given by $(a, b)\overrightarrow{a+4b^2})$ is a binary operation. Compute $(-5) \cdot 2 \cdot 0)$. Watch Free Video Solution on Doubtnut
2	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** The elements a_{ij} of a 3×3 matrix are given by $a_{ij} = \frac{1}{2}\|-3i+j\|$. Write the value of element a_{32} Watch Free Video Solution on Doubtnut
3	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Write the principal value of $\tan^{-1}\left[\sin\left(-\frac{\pi}{2}\right)\right]$ Watch Free Video Solution on Doubtnut

4	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** If $(2x4)(x-8)=0$, find the positive value of x Watch Free Video Solution on Doubtnut
5	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Write the value of $\|276538755986\|$ Watch Free Video Solution on Doubtnut
6	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Find $\int \frac{\sin^6 x}{\cos^8 x} dx$. Watch Free Video Solution on Doubtnut
7	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Evaluate: $\int \frac{\tan^{-1} x}{1+x^2} dx$ Watch Free Video Solution on Doubtnut
doubtnut पढ़ना हुआ आसान	
8	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** If $\left\|\vec{a}\right\|=8, \left\|\vec{b}\right\|=3$ and $\left\|\vec{a} x \vec{b}\right\|=12,$ find the angle between $\vec{a}$ and $\vec{b}$. Watch Free Video Solution on Doubtnut

9	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Find the angle between x-axis and the vector $\hat{i}+\hat{j}+\hat{k}$ Watch Free Video Solution on Doubtnut
10	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Write the equation of the straight line through the point $(\alpha, \beta, \gamma$ and parallel to z-axis. Watch Free Video Solution on Doubtnut
11	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Let $f, g: R\overrightarrow{R}$ be two functions defined as $f(x)=\|x\|+x$ and $g(x)=\|x\|-x$, for all xR. Then find fog and gof. Watch Free Video Solution on Doubtnut
doubtnut पढ़ना हुआ आसान	
12	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Prove that: $\cos^{-1}(x)$ $+\cos^{-1}\{\frac{x}{2}$ $+\frac{\sqrt{3-3x^2}}{2})=\frac{\pi}{3}$ Watch Free Video Solution on Doubtnut

13	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Solve for x: $\tan^{-1} x + 2\cot^{-1} x$ $= \frac{2\pi}{3}$ Watch Free Video Solution on Doubtnut
14	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Using properties of determinants, prove the following : $\|b + caabc + ab\mathrm{a}$ $+ b\| = 4abc$ Watch Free Video Solution on Doubtnut
15	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Find the value of the constant k so that the function f , defined below, is continuous at $x = 0$, where $f(x)$ $= \left\{ \left(\frac{1 - \cos 4x}{8x^2} \right) k \mathrm{if} x \neq \mathrm{if} x = 0 \right.$ Watch Free Video Solution on Doubtnut
	
	CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA If

16	$y = \tan^{-1}\left(\frac{a}{x}\right)$ $+ \log\sqrt{\frac{x-a}{x+a}}$, Prove that $\frac{dy}{dx} = \frac{2a^3}{x^4 - a^4}$ Watch Free Video Solution on Doubtnut
17	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Find the intervals in which the function given by $f(x) = \frac{3}{10}x^4$ $= \frac{4}{5}x^3 - 3x^2$ $+ \frac{36}{5}x + 11$ is (a) strictly increasing (b) strictly decreasing. Watch Free Video Solution on Doubtnut
18	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** The sides of an equilateral triangle are increasing at the rate of 2 cm/sec. Find the rate at which the area increases, when the side is 10 cm. Watch Free Video Solution on Doubtnut
19	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Show that : $\int_0^{\frac{\pi}{2}} \frac{\sin^2 x}{\sin x + \cos x} dx$ $= \frac{1}{\sqrt{2}}\log\left(\sqrt{2}+1\right)$ Watch Free Video Solution on Doubtnut

20	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Find: $\int \frac{x^3}{x^4+3x^2+2}dx$ Watch Free Video Solution on Doubtnut
21	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Find the particular solution of the differential equation $x\frac{dy}{dx}=y$ $+x\operatorname{cosec}\left(\frac{y}{x}\right)$ $=0;$ given that $y=0$ when $x=1.$ Watch Free Video Solution on Doubtnut
22	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Solve the differential equation $x\frac{dy}{dx}+y=x\cos x$ $+\sin x,$ given $y\left(\frac{\pi}{2}\right)=1$ Watch Free Video Solution on Doubtnut
23	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Find the distance of the point $(-1,-5,-10)$ from the point of intersection of the line $\vec{r}=2\hat{i}-\hat{j}+2\hat{k}$ $+\lambda\left(3\hat{i}+4\hat{j}+2\hat{k}\right)$

and the plane $\vec{r}\,\hat{i} - \hat{j} + \hat{k} = 5.$

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Find the vector $\vec{p}$ which is perpendicular to both $\vec{\alpha} = 4\hat{i} + 5\hat{j} - \hat{k}$ and $\vec{\beta} = \hat{i} - 4\hat{j} + 5\hat{k}$ and $\vec{p}\,\vec{q} = 21,$ where $\vec{q} = 3\hat{i} + \hat{j} - \hat{k}.$

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Find the unit vector perpendicular to the plane ABC where the position vectors of A, B and C are
$2\hat{i} - \hat{j} + \hat{k}, \hat{i} + \hat{j}$
$+ 2\hat{k}$
and $2\hat{i} + 3\hat{k}$ respectively.

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A class has 15 students whose ages are 14, 17, 15, 14, 21, 17, 19, 20, 16, 18, 20, 17, 16, 19 and 20 years. One student is selected in such a manner that each has the same chance of being chosen and the age X of the selected student is recorded. What is the probability distribution of the random variable X ? Find the mean of X.

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AB is a diameter of a circle and C is any point on the circumference of the circle. Then the area of ABC is maximum when it is isosceles the area of ABC is minimum when it is isosceles the perimeter of ABC is minimum when it is isosceles none of these

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Using integration, find the area of the triangle PQR, coordinates of whose vertices are P(2, 0), Q(4, 5) and R(6, 3).

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Find :

$$\int \left(\sqrt{x^2+1} \frac{\log\left(x^2+1\right) - 2\log x}{x^4} dx \right.$$

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Find :

$$\int \frac{\sin^{-1}\sqrt{x} - \cos^{-1}\sqrt{x}}{\sin^{-1}\sqrt{x} + \cos^{-1}\sqrt{x}} dx, x \in [0, 1]$$

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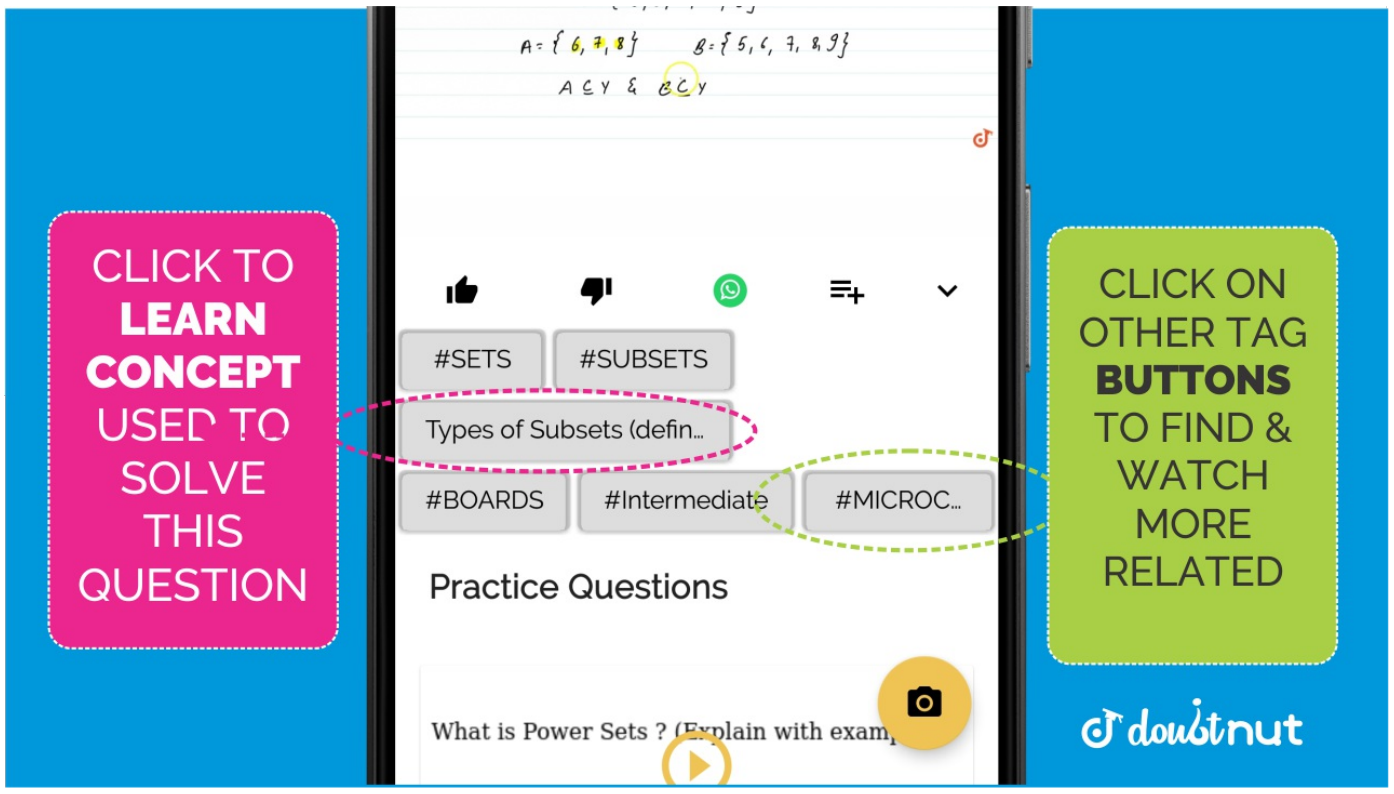
31	An urn contains 4 balls. Two balls are drawn at random from the urn (without replacement) and are found to be white. What is the probability that all the four balls in the urn are white ? Watch Free Video Solution on Doubtnut
doubtnut पढ़ना हुआ आसान	
32	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** In a game, a man wins rupees five for a six and loses rupee one for any other number, when a fair die is thrown. The man decided to throw a die thrice but to quit as and when he gets a six. Find the expected value of the amount he wins/loses. Watch Free Video Solution on Doubtnut
33	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** Two schools, P and Q, want to award their selected students for the values of sincerity, truthfulness and hard work at the rate of ` Watch Free Video Solution on Doubtnut
34	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || ALL INDIA** One kind of cake requires 200 g of flour and 25 g of fat, another kind of cake requires 100 g of flour and 50 g of fat. Find the maximum number of cakes which can be made from 5 kg of flour and 1 kg of fat, assuming that there is no shortage of the other ingredients used in making the cakes. Make it an LPP and solve it graphically. Watch Free Video Solution on Doubtnut
35	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Let * be a binary operation, on the set of all-zero real numbers, given by a

	$a \cdot b = \frac{ab}{5}$ for all $a, bR - \{0\}$. Find the value of x given that $2 \cdot (x \cdot 5) = 10$. Watch Free Video Solution on Doubtnut
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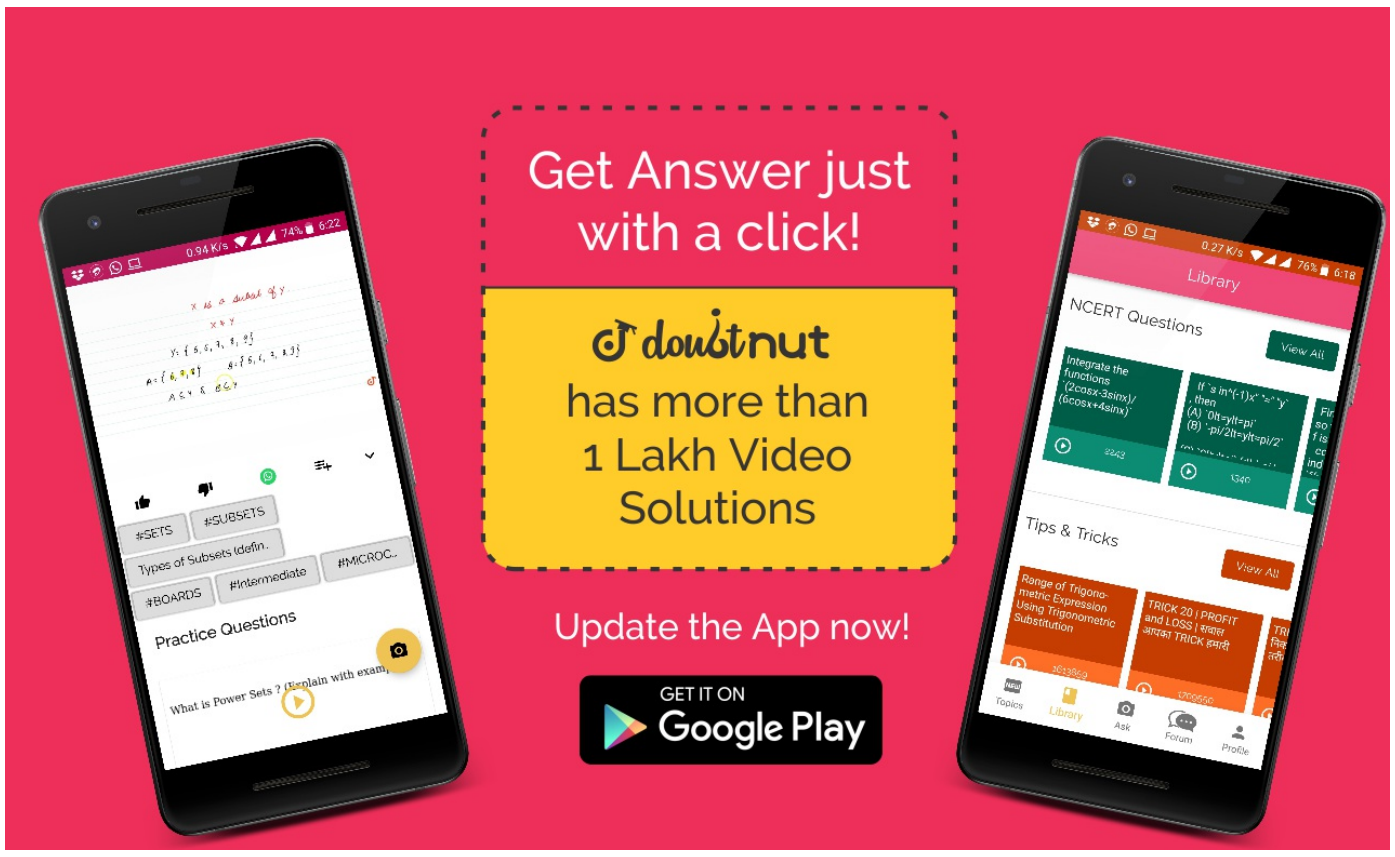
36	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** If $\sin\left(\frac{\sin^{-1} 1}{5} + \cos^{-1} x\right) = 1,$ then find the value of x. Watch Free Video Solution on Doubtnut
37	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** If $2[345x] + [1y01] = [70105],$ find $(x - y)$. Watch Free Video Solution on Doubtnut
38	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Solve the following matrix equation for $x:, [x1][10 - 20] - O$. Watch Free Video Solution on Doubtnut
	CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI

39	If $\|2x58x\| = \|6-273\|$, write the value of x. Watch Free Video Solution on Doubtnut
	
40	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Write the antidervative of $\left(3\sqrt{x}+\frac{1}{\sqrt{x}}\right)$. Watch Free Video Solution on Doubtnut
41	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Evaluate : $\int_0^3 \frac{dx}{9+x^2}$ Watch Free Video Solution on Doubtnut
42	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Find the projection of the vector $\hat{i}+3\hat{j}+7\hat{k}$ on the vector $2\hat{i}-3\hat{j}+6\hat{k}$. Watch Free Video Solution on Doubtnut
43	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** If $\vec{a}$ and $\vec{b}$ are two unit vectors such that $\vec{a}+\vec{b}$ is also a unit vector, then find the angle between $\vec{a}$ and $\vec{b}$. Watch Free Video Solution on Doubtnut

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CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI

Write the vector equation of the plane, passing through the point (a,b,c) and parallel to the plane $\vec{r}\hat{i} + \dot{\hat{j}} + \hat{k} = 2.$

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Let $A = \{1, 2, 3, ,. 9\}$ and R be the relation in AxA defined by $(a, b)R(c, d)$ if $a + d = b + c$ for $(a, b), (c, d)$ in AxA. Prove that R is an equivalence relation. Also obtain the equivalence class [(2,5)].

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Prove that

$$\cot^{-1}\left(\frac{\sqrt{1+\sin} + \sqrt{1-\sin x}}{1\sqrt{1+\sin} - \sqrt{1-\sin x}}\right) = \frac{x}{2}; x \in \left(0, \frac{\pi}{4}\right).$$

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47	Prove that $2\tan^{-1}\left(\frac{1}{5}\right) + \sec^{-1}\left(\frac{5\sqrt{2}}{7}\right) + 2\tan^{-1}\left(\frac{1}{8}\right) = \frac{\pi}{4}.$ Watch Free Video Solution on Doubtnut
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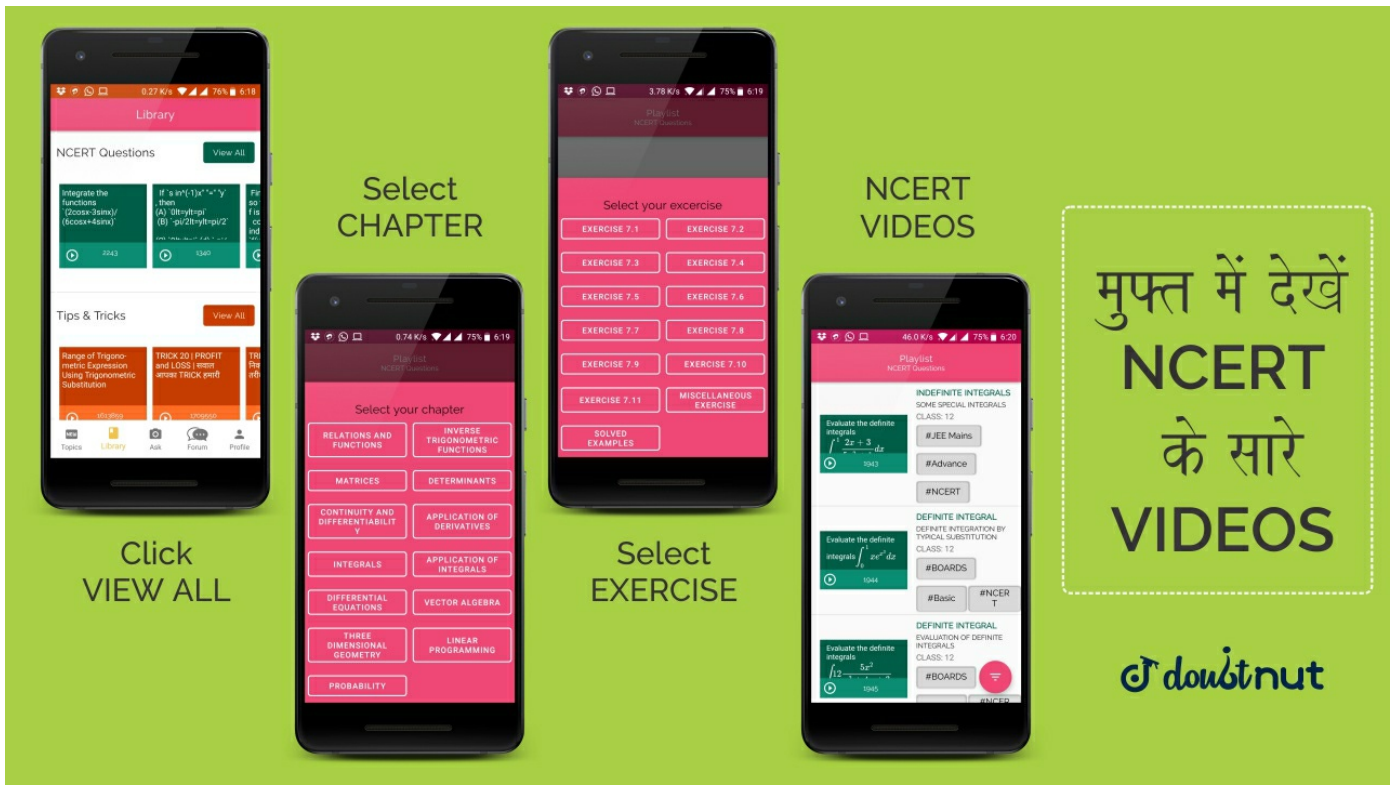
48	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Using properties of determinants, prove that $\begin{vmatrix} 2y & y-z-x & 2y \\ 2z & z-x-y & 2z \\ z & z & x+y+z \end{vmatrix} = (x+y+z)^3$ Watch Free Video Solution on Doubtnut
49	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Differentiate $\tan^{-1}\left(\frac{\sqrt{1-x^2}}{x}\right)$ with respect to $\cos^{-1}\left(2x\sqrt{1-x^2}\right)$, when $x \neq 0$. Watch Free Video Solution on Doubtnut

50	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Find the intervals in which the function $f(x) = 3x^4 - 4x^3$ $- 12x^2 + 5$ is (a) strictly increasing (b) strictly decreasing Watch Free Video Solution on Doubtnut
51	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Find the equations of the tangent and normal to the curve $x = a\sin^3\theta and y$ $= a\cos^3\theta$ at $\theta = \frac{\pi}{4}$. Watch Free Video Solution on Doubtnut
doubtnut पढ़ना हुआ आसान	
52	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Evaluate : $\int \frac{\sin^6 x + \cos^6 x}{\sin^2 x \cos^2 x} dx$ Watch Free Video Solution on Doubtnut
53	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Evaluate : $\int (x$ $- 3$ $)\sqrt{x^2 + 3x - 18} dx$ Watch Free Video Solution on Doubtnut

54	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Find the particular solution of the differential equation $e^x\sqrt{1-y^2}dx$ $+\frac{y}{x}dy=0,$ given that $y=1$ when $x=0$ Watch Free Video Solution on Doubtnut
55	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Prove that, for any three vectors $\vec{a}, \vec{b}, \vec{c}$ $\left[\vec{a}+\vec{b}, \vec{b}+\vec{c},\right.$ $\left.\vec{c}+\vec{a}\right]=2\left[\vec{a},\right.$ $\left.\vec{b}, \vec{c}\right]$ Watch Free Video Solution on Doubtnut
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56	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Vector $\vec{a}, \vec{b}$ and $\vec{c}$ are such that $\vec{a}+\vec{b}+\vec{c}=\vec{0}$ and $\|a\|=3, \left\|\vec{b}\right\|=5$ and $\left\|\vec{c}\right\|=7.$ Find the angle between $\vec{a}$ and $\vec{b}$.

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Show that the lines
$$\frac{x+1}{3}=\frac{y+3}{5}$$
$$=\frac{z+5}{7}$$
and
$$\frac{x-2}{1}=\frac{y-4}{3}$$
$$=\frac{z-6}{5}$$
intersect. Also find the their point of intersection.

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CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI

Assume that each born child is equally likely to be a boy or a girl. If a family has two children, what is the conditional probability that both are girls ? Given that (i) the youngest is a girl. (ii) atleast one is a girl.

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Show that the semi-vertical angle of the cone of the maximum volume and of given slant height is $\frac{\cos^{-1}1}{\sqrt{3}}$

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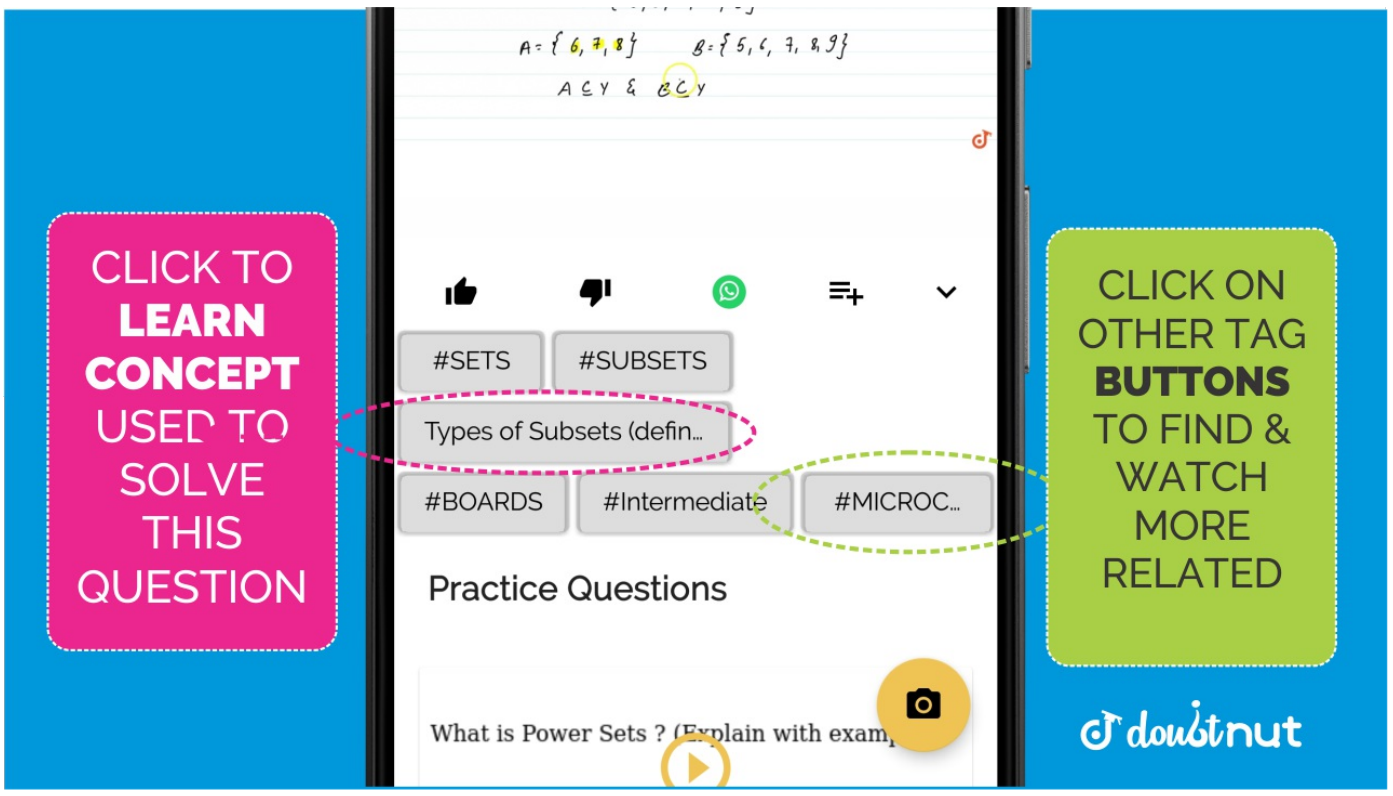
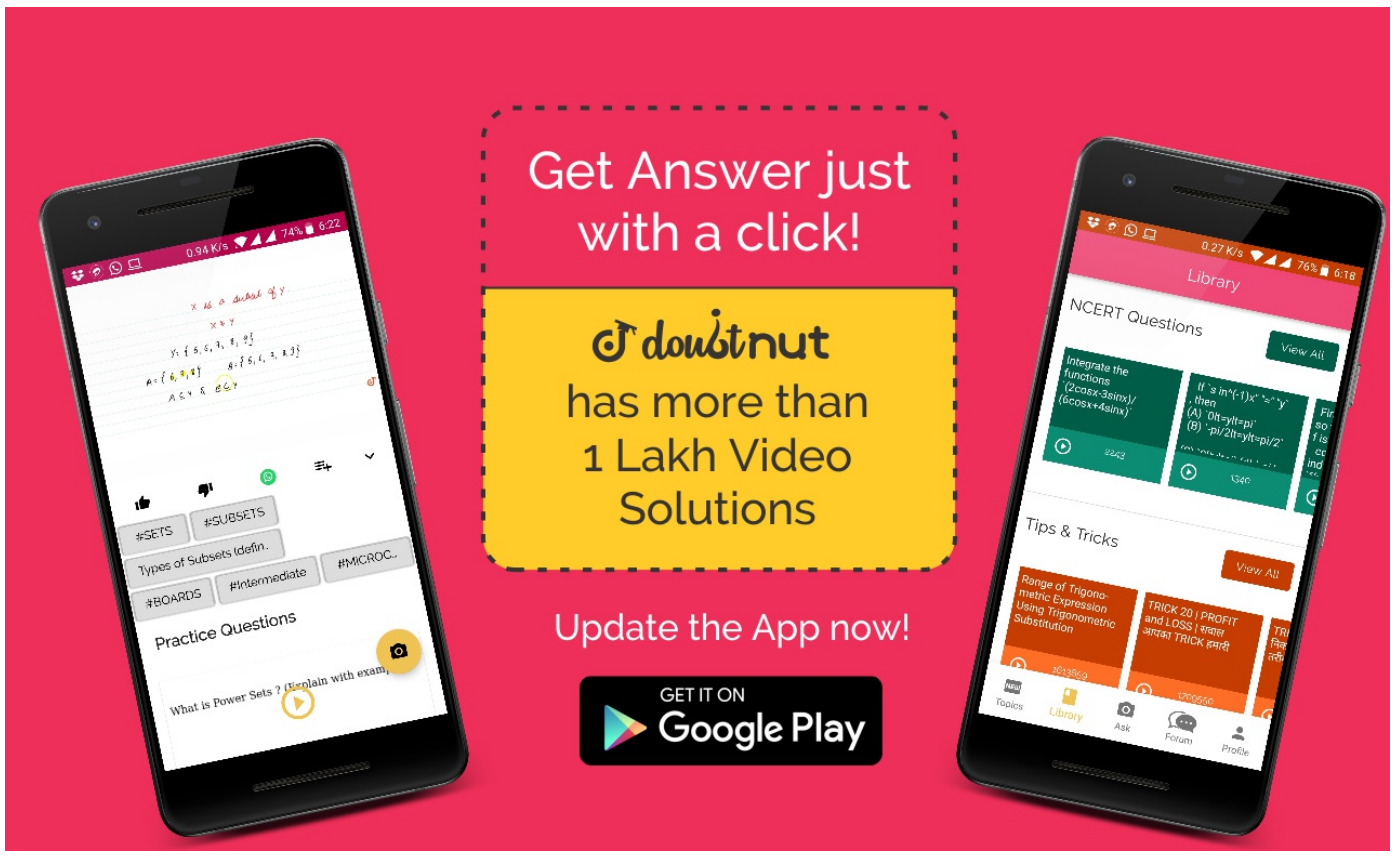
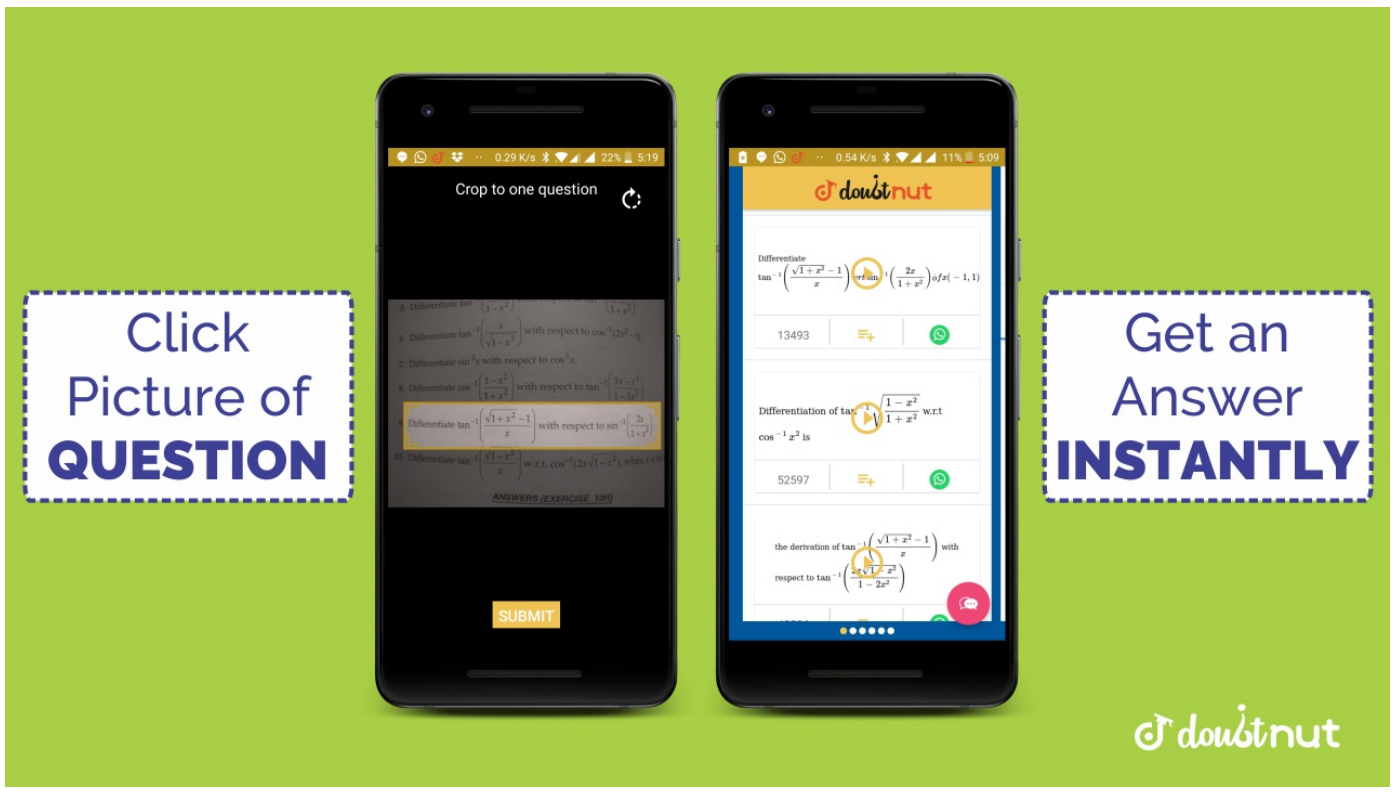
CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI

60	Evaluate : $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{dx}{1+\sqrt{\cot x}}$ Watch Free Video Solution on Doubtnut
61	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Find the distance between the point $(7, 2, 4)$ and the plane determined by the points $a(2, 5, -3)$, $B(-2, -3, 5)$ and $C(5, 3, -3)$. Watch Free Video Solution on Doubtnut
62	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Find the distance of the point $(-1, -5, -10)$ from the point of intersection of line $\vec{r} = 2\hat{i} - \hat{j} + 2\hat{k}$ $+ \lambda\left(3\hat{i} + 4\hat{j} + 2\hat{k}\right)$ and the plane $\vec{r}\,\hat{i} - \hat{j} + \hat{k} = 5$. Watch Free Video Solution on Doubtnut
63	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** A dealer in rural area wishes to purchase a number of sewing machines. He has only Rs. 5,760 to invest and has space for at most 20 items for storage. An electronic sewing machine cost him Rs. 360 and a manually operated sewing machine Rs. 240. He can sell an electronic sewing machine at a profit of Rs. 22 and a manually operated sewing machine at a profit of Rs. 18. Assuming that he can sell all the items that he can buy, how should he invest his money in order to maximize his profit? Make it as a LPP and solve it graphically. Watch Free Video Solution on Doubtnut
	

64	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** A card from a pack of 52 playing cards is lost. From the remaining cards of the pack three cards are drawn at random (without replacement) and are found to be all spades. Find the probability of the lost card being a spade. Watch Free Video Solution on Doubtnut
65	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** From a lot of 15 bulbs which include 5 defectives, a sample of 4 bulbs is drawn one by one with replacement. Find the probability distribution of number of defective bulbs. Hence find the mean of the distribution. Watch Free Video Solution on Doubtnut
66	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Let R be the equivalence relation in the set $A = \{0, 1, 2, 3, 4, 5\}$ given by $R = \{(a, b)$ $: divides(a - b)\}$. Write the equivalence class [0]. Watch Free Video Solution on Doubtnut
67	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Write the projection of the vector $2\hat{i} - \hat{j} + \hat{k}$ on the vector $\vec{b} = \hat{i} + 2\hat{j} + 2\hat{k}$. Watch Free Video Solution on Doubtnut
	
68	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Write a $x2x$ matrix which is both symmetric and skew-symmetric. Watch Free Video Solution on Doubtnut

69	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Write the distance of a point $P(a, b, c)$ from x-axis. Watch Free Video Solution on Doubtnut
70	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Write a vector in the direction of the vector $\hat{i} - 2\hat{j} + 2\hat{j} + 2\hat{k}$ that has magnitude 9 units. Watch Free Video Solution on Doubtnut
71	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Write the principal value of $\cos^{-1}\left[\cos\left(680^0\right)\right]$. Watch Free Video Solution on Doubtnut
72	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** If, $\left[x\dot{y}4z + 6x + y\right]$ $= [8w06]$, write the value of $(x + y + z)$. Watch Free Video Solution on Doubtnut
73	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Find : $\int \frac{\sin^2 x - \cos^2 x}{\sin^2 x \cos^2 x} dx$ Watch Free Video Solution on Doubtnut

74	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Write the derivative of $\sin x$ w.r.t. $\cos x$. Watch Free Video Solution on Doubtnut
75	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Write the value of the determinant $\begin{vmatrix} p & p+1 \\ p-1 & p \end{vmatrix}$. Watch Free Video Solution on Doubtnut
doubtnut पढ़ना हुआ आसान	
76	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Let S be the set of all rational number except 1 and * be defined on S by $a \cdot b = a + b - ab$, for all a, bS. Prove that (i) * is a binary operation on `(i i) * is commutative as well as associative. Watch Free Video Solution on Doubtnut
77	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Solve for x: $2\tan^{-1}(\cos x)$ $= \tan^{-1}(2\cos ecx)$ Watch Free Video Solution on Doubtnut
	CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI Using properties of determinants, prove the following :

78	$\left\|aa^2bc \hat{} \ 2ca \hat{} \ 2ab\right\|$ $= (a-b)(b-c)(c$ $-a)(bc+ca+ab)$ Watch Free Video Solution on Doubtnut
79	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** If $x = a(\cos t$ $+ t\sin t)and$ y=a (sin t - t cos t), then find the value of $\frac{d^2y}{dx^2}$ at $t = \frac{\pi}{4}$. Watch Free Video Solution on Doubtnut
doubtnut पढ़ना हुआ आसान	
80	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** If $(x-y)\dot{e}^{\frac{x}{x-y}} = a,$ Prove that $y\frac{dy}{dx} + x = 2y.$ Watch Free Video Solution on Doubtnut
81	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** The sum of the perimeters of a circle and a square is k , where k is some constant. Prove that the sum of their areas is least when the side of the square is double the radius of the circle. Watch Free Video Solution on Doubtnut
82	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** Using differentials, find the approximate value of $(3.968)^{\frac{3}{2}}$

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83

CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI

Evaluate : $\int_0^{\frac{\pi}{2}} x^2 \sin x dx$

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84

CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI

Find :

$\int (x + 3) \sqrt{3 - 4x - x^2} dx$

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CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI

If $y(x)$ is a solution of the differential equation

$\left(\frac{2 + \sin x}{1 + y}\right) \frac{dy}{dx} = -\cos x$

and $y(0) = 1$, then find the value of $y\left(\frac{\pi}{2}\right)$.

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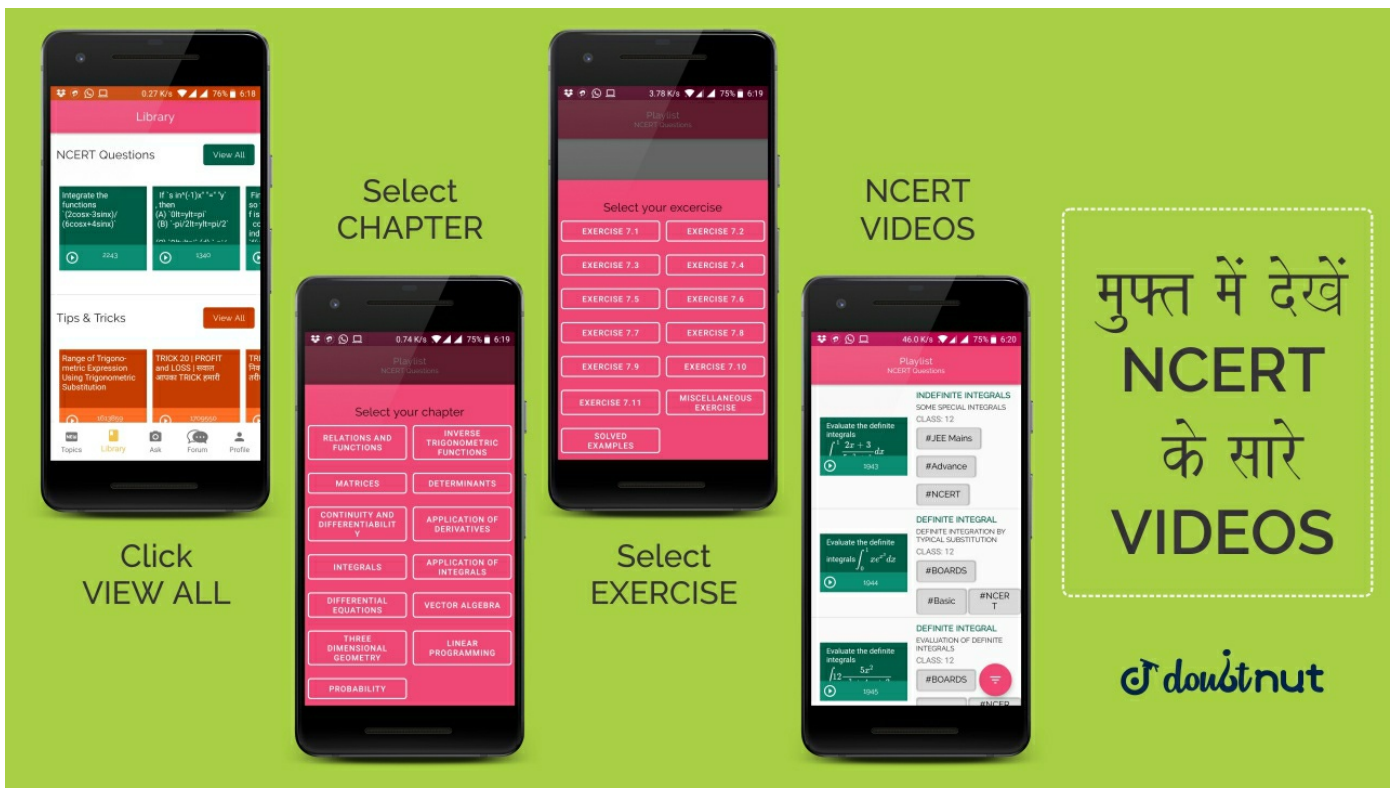
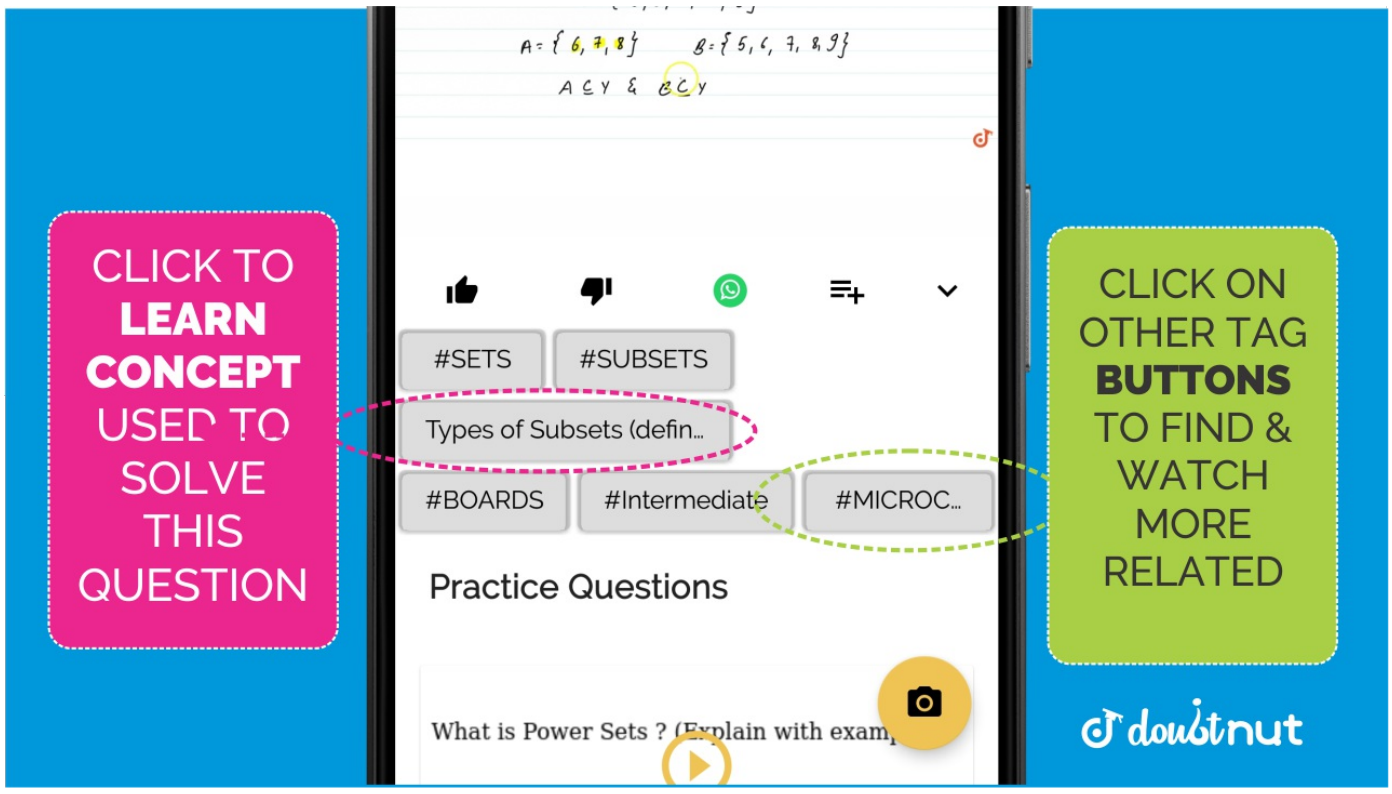
Find the direction cosines of the line

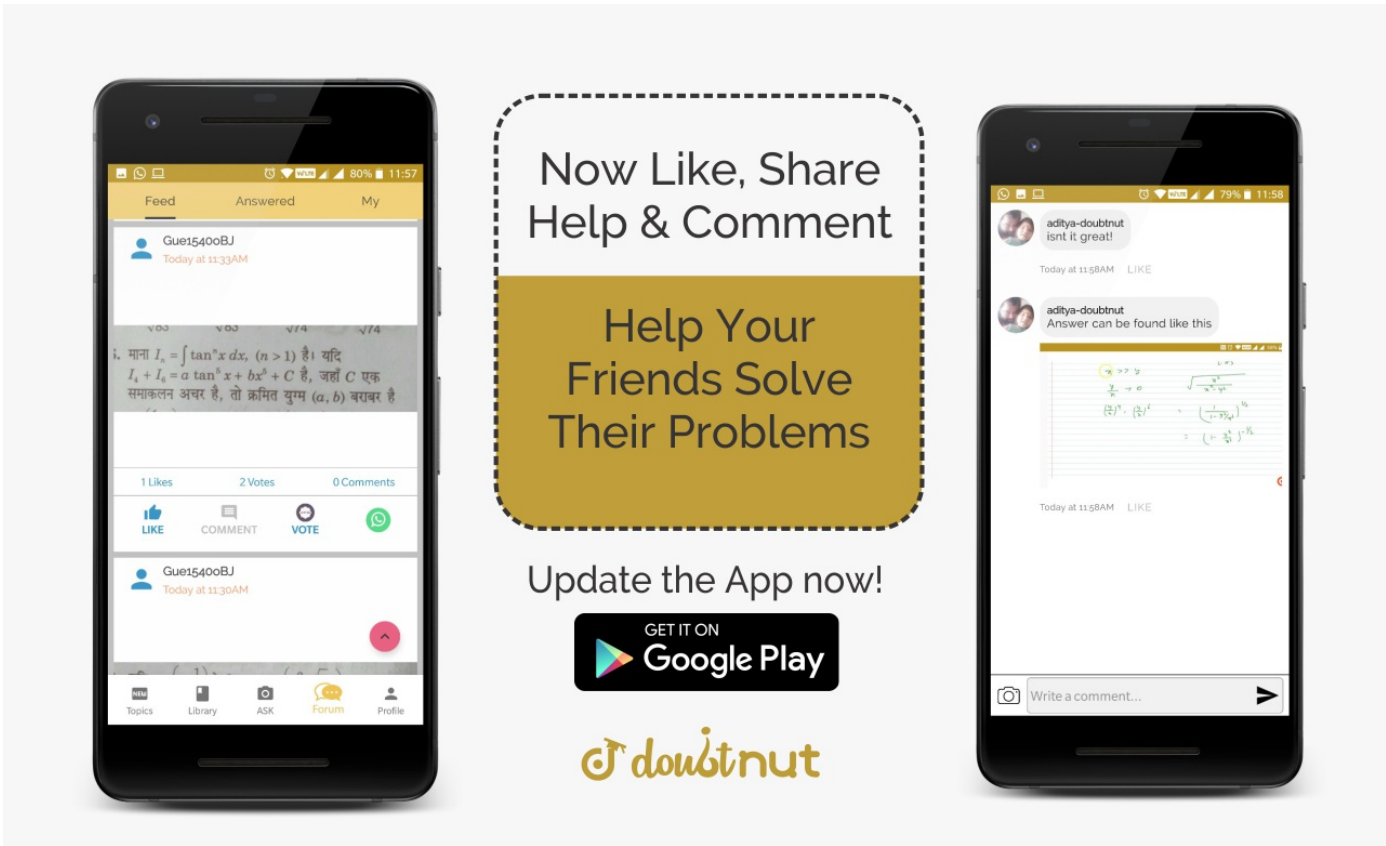
86	$\frac{x+2}{2}=\frac{2y-7}{6}$ $=\frac{5-z}{6}$. Also, find the vector equation of the line through the point $A(-1,2,3)$ and parallel to the given line. Watch Free Video Solution on Doubtnut
87	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** If $\vec{a}=2\hat{i}-3\hat{j}+\hat{k}, \hat{b}$ $=-\hat{i}+\hat{k}, \vec{c}$ $=2\hat{j}-\hat{k}$ are three vectors, find the area of the parallelogram having diagonals $\left(\vec{a}+\vec{b}\right)$ and $\left(\vec{b}+\vec{c}\right)$. Watch Free Video Solution on Doubtnut
doubtnut पढ़ना हुआ आसान	
88	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || DELHI** If the three vectors $\vec{a}$, $\vec{b}$, $\vec{c}$ are coplanar, prove that the vectors $\vec{a}+\vec{b}$, $\vec{b}+\vec{c}$ and $\vec{c}+\vec{a}$ are also coplanar. Watch Free Video Solution on Doubtnut
89	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Let $R=\{a,a^3):a$ is a prime number less than $5\}$ be a relation. Find the range of R. Watch Free Video Solution on Doubtnut

90	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Write the value of $\cos^{-1}\left(-\frac{1}{2}\right)$ $+2\sin^{-1}\left(\frac{1}{2}\right)$ Watch Free Video Solution on Doubtnut
91	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** If $(a+43b8-6)$ $=(2ab+28a$ $-8b)$, write the value of $a-2b$. Watch Free Video Solution on Doubtnut
	
92	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** If A is $a3x3$ matrix, $\|A\| \neq 0$ and $\|3A\| = k\|A\|$, then write the value of k . Watch Free Video Solution on Doubtnut
93	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Evaluate : $\int \frac{dx}{\sin^2 x \cos^2 x}$ Watch Free Video Solution on Doubtnut

94	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Evaluate : $\int_0^{\frac{\pi}{4}} \tan x dx$ Watch Free Video Solution on Doubtnut
95	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Write the projection of vector $\hat{i}+\hat{j}+\hat{k}$ along the vector $\hat{j}$. Watch Free Video Solution on Doubtnut
96	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Find a vector in the direction of vector $2\hat{i}-3\hat{j}+6\hat{k}$ k which has magnitude 21 units. Watch Free Video Solution on Doubtnut
97	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Find the angle between the lines $\vec{r}=2\hat{i}-5\hat{j}+\hat{k}$ $+\lambda\left(3\hat{i}+2\hat{j}+6\hat{k}\right)$ and $\vec{r}=7\hat{i}-6\hat{k}$ $+\mu\left(\hat{i}+2\hat{j}+2\hat{k}\right)$. Watch Free Video Solution on Doubtnut
	CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN Let $f: W\overrightarrow{W}$, be defined as $f(x)=x1$, if x is odd and $f(x)=x+1$, if x is even.

98	Show that f is invertible. Find the inverse of f , where W is the set of all whole numbers. Watch Free Video Solution on Doubtnut
99	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Solve for x: $\cos\left(\tan^{-1} x\right)$ $= \sin\left(\frac{\cot^{-1} 3}{4}\right)$ Watch Free Video Solution on Doubtnut
doubtnut पढ़ना हुआ आसान	
100	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Prove that : $\cot^{-1} 7 + \cot^{-1} 8$ $+ \cot^{-1} 18$ $= \cot^{-1} 3$ Watch Free Video Solution on Doubtnut
101	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Using properties of determinants, prove that $\|a + xyzxa + yzxya$ $+ z\| = a^2(a + x$ $+ y + z)$ Watch Free Video Solution on Doubtnut
	CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN

102	$x = a\cos\theta + b\sin\theta$ and $y = a\sin\theta - b\cos\theta,$ show that $y^2\dfrac{d^2y}{dx^2} - x\dfrac{dy}{dx} + y = 0$ Watch Free Video Solution on Doubtnut
103	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** If $x^m y^n = (x+y)^{m+n},$ Prove that $\dfrac{dy}{dx} = \dfrac{y}{x}.$ Watch Free Video Solution on Doubtnut
doubtnut पढ़ना हुआ आसान	
104	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Find the approximate value of $f(3.02),$ upto 2 places of decimal, where $f(x) = 3x^2 + 5x + 3.$ Watch Free Video Solution on Doubtnut
105	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Find the intervals in which the function $f(x) = \dfrac{3}{2}x^4 - 4x - 45x + 51$ is (a) strictly increasing. (b) strictly decreasing. Watch Free Video Solution on Doubtnut

106	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Evaluate : $\int \frac{x \cos^{-1} x}{1-x^2} dx$ Watch Free Video Solution on Doubtnut
107	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Evaluate : $\int (3x - 2)\sqrt{x^2+x+1}$ dx Watch Free Video Solution on Doubtnut
	
108	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Solve the differential equation $(x^2 - y)dy + (y^2 + x^2y^2)dx = 0,$ given that $y = 1,$ when $x = 1.$ Watch Free Video Solution on Doubtnut
109	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Solve the differential equation $\frac{dy}{dx} + y \cot x = 2 \cos x,$ given that $y = 0,$ when $x = \frac{\pi}{2}.$

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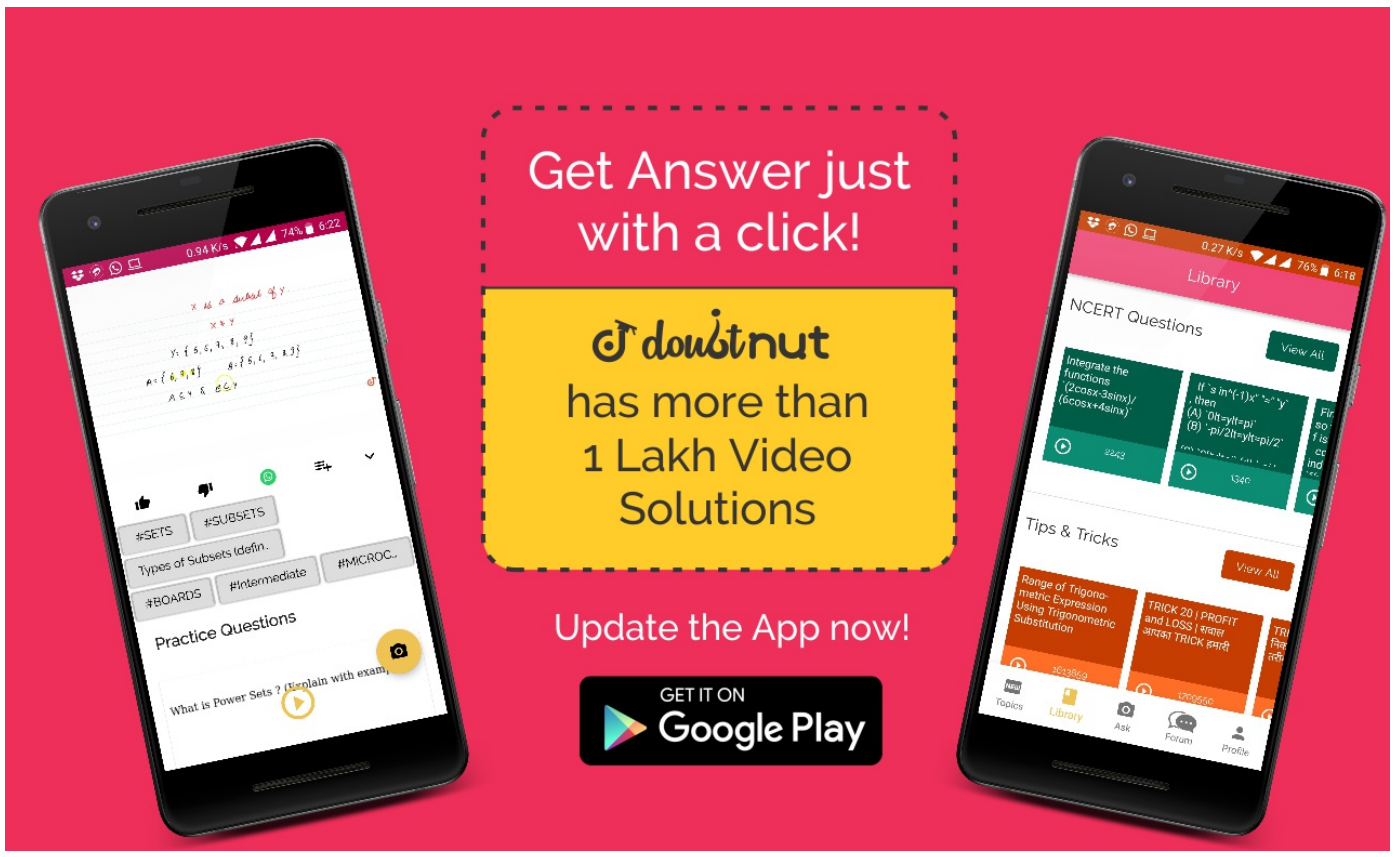
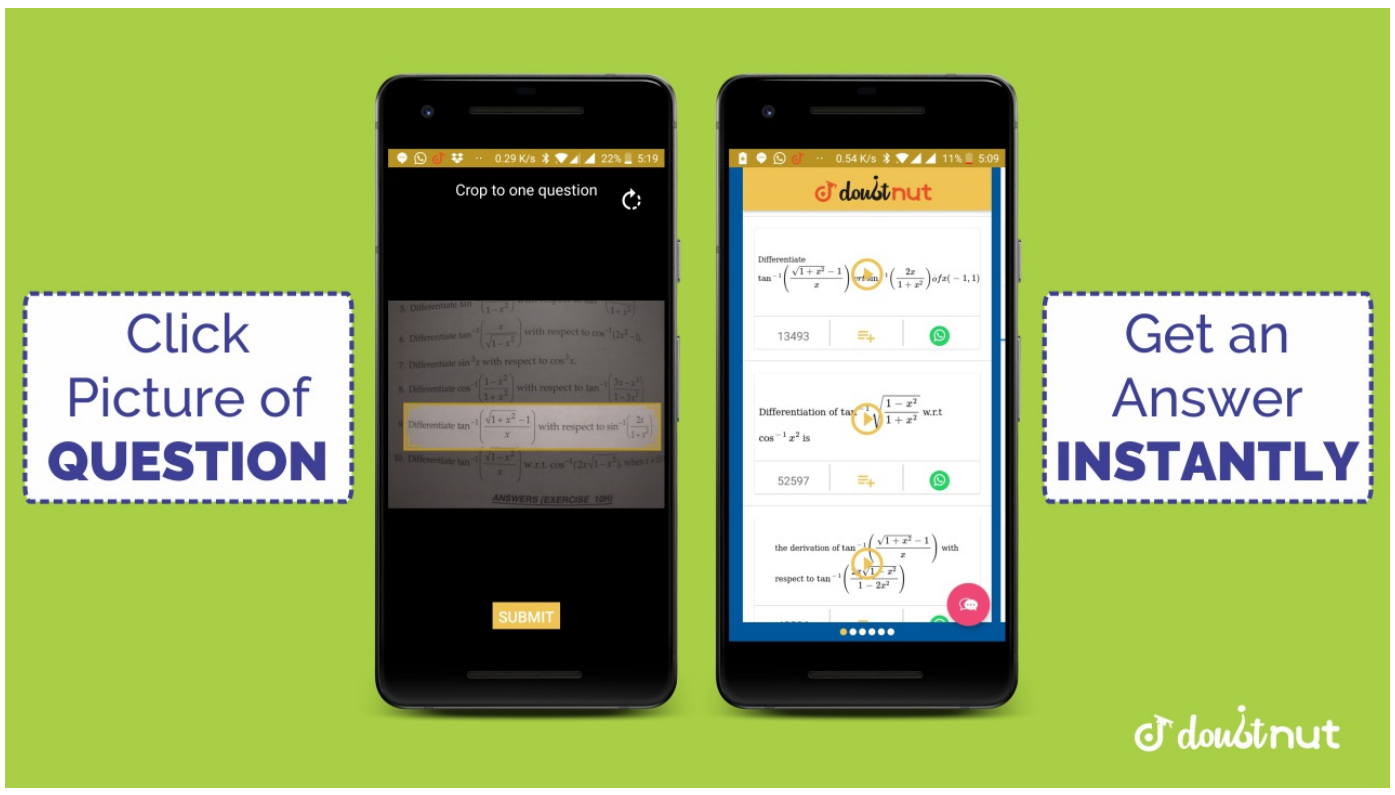
110	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Show that the vectors $\vec{a}$, $\vec{b}$, $\vec{c}$ are coplanar if and only if $\vec{a}+\vec{b}$, $\vec{b}+\vec{c}$ and $\vec{c}+\vec{a}$ are coplanar. Watch Free Video Solution on Doubtnut
111	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Find a unit vector perpendicular to both of the vectors $\vec{a}+\vec{b}$ and $\vec{a}-\vec{b}$ where $\vec{a}=\hat{i}+\hat{j}+\hat{k}$, $\vec{b}$ $=\hat{i}+2\hat{j}+3\hat{k}$. Watch Free Video Solution on Doubtnut
	
112	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Find the shortest distance between the lines whose vector equations are $\vec{r}=\hat{i}+\hat{j}$ $+\lambda\left(2\hat{i}-\hat{j}+\hat{k}\right)$ and $\vec{r}=2\hat{i}+\hat{j}-\hat{k}$ $+\mu\left(3\hat{i}-5\hat{j}+2\hat{k}\right)$. Watch Free Video Solution on Doubtnut
	CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN

113	Three cards are drawn at random (without replacement) from a well shuffled pack of 52 playing cards. Find the probability distribution of number of red cards. Hence find the mean of the distribution. Watch Free Video Solution on Doubtnut
114	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Two schools P and Q want to award their selected students on the values of Tolerance, Kindness and Leadership. The school P wants to award Rs. x each, Rs. y each and Rs. z each for the three respective values to 3, 2 and 1 students respectively with a total award money of Rs. 2,200. School Q wants to spend Rs. 3,100 to award its 4, 1 and 3 students on the respective values (by giving the same award money to the three values as school P). If the total amount of award for one prize on each value is Rs. 1,200, using matrices, find the award money for each value. Apart from these three values, suggest one more value which should be considered for award. Watch Free Video Solution on Doubtnut
115	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Show that a cylinder of a given volume which is open at the top has minimum total surface area, when its height is equal to the radius of its base. Watch Free Video Solution on Doubtnut
	
116	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Evaluate : $\int_0^{\pi} \frac{x \tan x}{\sec x + \tan x} dx$ Watch Free Video Solution on Doubtnut
	CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN Find the area of the smaller region bounded by the ellipse $\frac{x^2}{9} + \frac{y^2}{4} = 1$ and the

117	line $\frac{x}{3}+\frac{y}{2}=1.$ Watch Free Video Solution on Doubtnut
118	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Find the equation of the plane that contains the point (1, – 1, 2) and is perpendicular to both the planes 2x + 3y – 2z = 5 and x + 2y – 3z = 8. Hence find the distance of point P(–2, 5, 5) from the plane obtained above. Watch Free Video Solution on Doubtnut
119	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Find the distance of the point P(–1, –5, –10) from the point of intersection of the line joining the points A(2, –1, 2) and B(5, 3, 4) with the plane x – y + z = 5. Watch Free Video Solution on Doubtnut
	
120	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** A cottage industry manufactures pedestal lamps and wooden shades, each requiring the use of a grinding/cutting machine and a sprayer. It takes 2 hours on the grinding/cutting machine and 3 hours on the sprayer to manufacture a pedestal lamp. It takes 1 hour on the grinding/cutting machine and 2 hours on the sprayer to manufacture a shade. On any day, the sprayer is available for at the most 20 hours and the grinding/cutting machine for at the most 12 hours. The profit from the sale of a lamp is Rs. 25 and that from a shade is Rs. 15. Assuming that the manufacturer can sell all the lamps and shades that he produces, how should he schedule his daily production in order to maximise his profit. Formulate an LPP and solve it graphically. Watch Free Video Solution on Doubtnut
121	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** An insurance company insured 2000 scooter drivers, 4000 car drivers and 6000 truck drivers. The probabilities of an accident for them are 0.01, 0.03 and 0.15 respectively. One of the insured persons meets with an accident. What is the probability that he is a scooter driver or a car driver?

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122	**CLASS 12 BOARDS MATHS SOLUTIONS - 2014 || FOREIGN** Five cards are drawn one by one, with replacement, from a well shuffled deck of 52 cards. Find the probability that (i) all the five cards are diamonds. (ii) only 3 cards are diamonds. (iii) none is a diamond. Watch Free Video Solution on Doubtnut
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