NCERT MATHS SOLUTIONS

Class - 12 || CONTINUITY AND DIFFERENTIABILITY

Ques No.	Question
1	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 1** Prove that the function $f(x) = 5x - 3$ is continuous at $x = 0$, at $x = -3$ and at $x = 5$. Watch Free Video Solution on Doubtnut
2	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 2** Examine the continuity of the function $f(x) = 2x^2 - 1$ at $x = 3$. Watch Free Video Solution on Doubtnut
3	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 3** Examine the following functions for continuity. (a) $f(x) = x - 5$ (b) $f(x) = \frac{1}{x-5}$ (c) $f(x) = \frac{x^2 - 25}{x + 5}$ (d) $f(x) = \lvert x - 5 \rvert$ Watch Free Video Solution on Doubtnut
4	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 4** Prove that the function $f(x) = x^n$ is continuous at $x = n$, where n is a positive integer. Watch Free Video Solution on Doubtnut
5	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 5** Is the function f defined by $f(x) = \{x, \quad \text{if} \quad x \leq 15, \quad \text{if} \quad x > 1$ continuous at

$x = 0?$ At
$x = 1?$ At
$x = 2?$

Watch Free Video Solution on Doubtnut

6

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 6

Find all points of discontinuity of f, where f is defined by
$f(x) = \{2x + 3,$
if $x \leq 22x - 3,$
if $x > 2$

Watch Free Video Solution on Doubtnut

7

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 7

Find all points of discontinuity of f, where f is defined by `f(x)={|x|+3, ifxlt=-3-2x , if-3
Watch Free Video Solution on Doubtnut

8

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 8

Find all points of discontinuity of f, where f is defined by
$f(x) = \begin{cases} \frac{|x|}{x}, & \text{if } x \\ \neq 00, & \text{if } x = 0 \end{cases}$

Watch Free Video Solution on Doubtnut

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY -

9	**EXERCISE 5.1 - Q 9** Find all points of discontinuity of f, where f is defined by $f(x) = \begin{cases} \frac{x}{\|x\|}, & \text{if } x \\ < 01, & \text{if } x \geq 0 \end{cases}$ Watch Free Video Solution on Doubtnut
10	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 10** Find all points of discontinuity of f, where f is defined by $f(x) = \begin{cases} x+1, \\ \text{if } x \geq 1, x^2+1, \\ \text{if } x < 1 \end{cases}$ Watch Free Video Solution on Doubtnut
11	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 11** Find all points of discontinuity of f, where f is defined by $f(x) = \begin{cases} x^3-3, \\ \text{if } x \leq 2x^2+1, \\ \text{if } x < 2 \end{cases}$ Watch Free Video Solution on Doubtnut
	NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 12 Find all points of discontinuity of f, where f is defined by

12	$f(x) = \{x^{10} - 1,$ $\text{if} \quad x \leq 1 x^2, \quad \text{if} \quad x$ > 1 Watch Free Video Solution on Doubtnut
13	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 13** Is the function defined by $f(x) = \{x + 5,$ $\text{if} \quad x \leq 1 x - 5,$ $\text{if} \quad x > 1$ a continuous function? Watch Free Video Solution on Doubtnut
14	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 14** Discuss the continuity of the function f, where f is defined by `f(x)={3, if0lt=xlt=1 4, if1 Watch Free Video Solution on Doubtnut
15	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 15** Discuss the continuity of the function f, where f is defined by $f(x)$ $= \{(2x, \quad \text{if} \quad x$ $< 1), (0, \quad \text{if} \quad 0 \leq x$ $\leq 1), (4x \quad \text{if} \quad x$ $> 1)$ Watch Free Video Solution on Doubtnut
16	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 16** Discuss the continuity of the function f, where f is defined by `f(x)={-2, ifxlt=-1 2x , if-11` Watch Free Video Solution on Doubtnut
17	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 17** Find the relationship between a and b so that the function f defined by

$f(x) = \{ax + 1,$
if $x \leq 3bx + 3$
if $x > 3$
is continuous at $x = 3$.

Watch Free Video Solution on Doubtnut

18

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 18

For what value of λ is the function defined by
$f(x)$
$= \{\lambda(x^2 - 2x),$
if $x \leq 04x + 1,$
if $x > 0$
continuous at $x = 0$? What about continuity at $x = 1$?

Watch Free Video Solution on Doubtnut

19

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 19

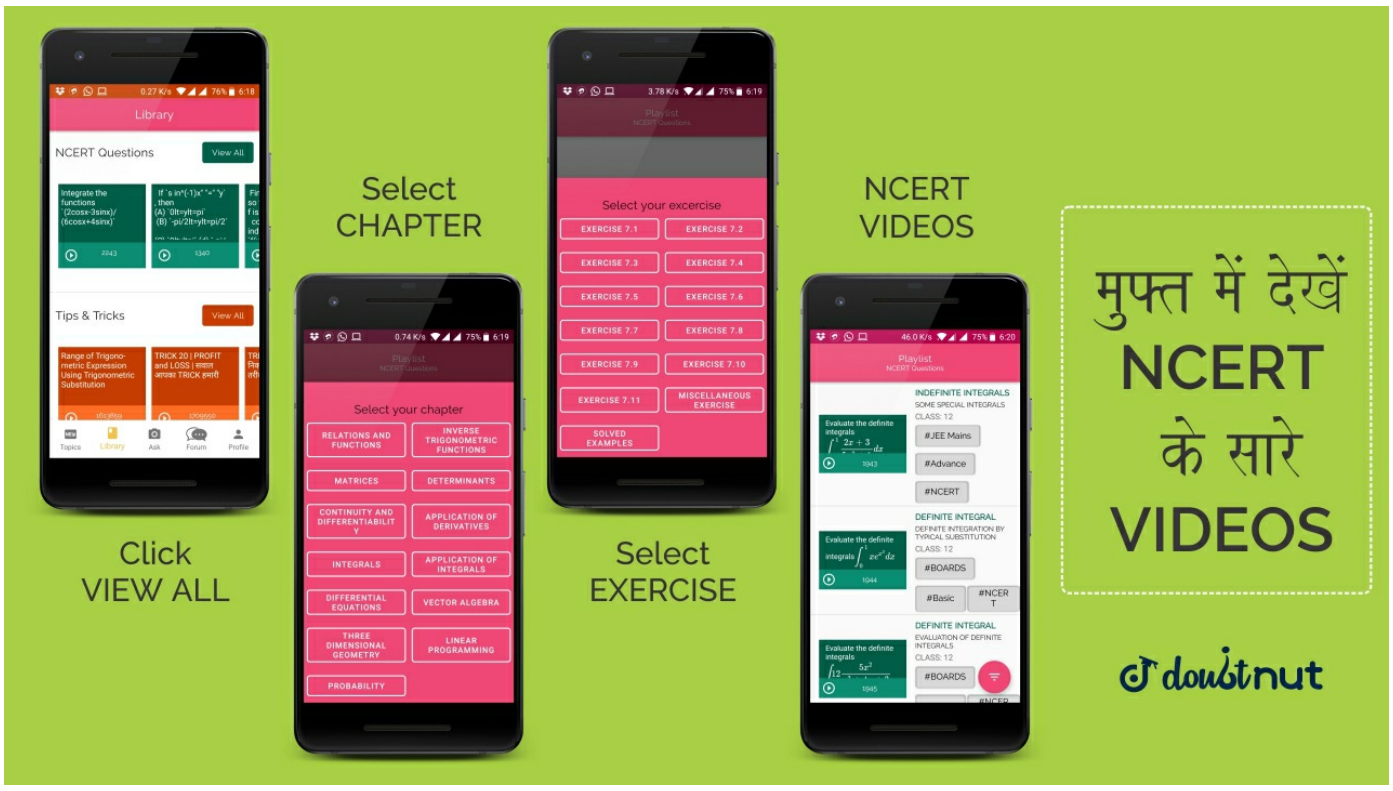
Show that the function defined by
$g(x) = x$
$[x]$
is discontinuous at all integral points. Here [x] denotes the greatest integer less than or equal to x.

Watch Free Video Solution on Doubtnut

20

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 20

Is the function defined by
$f(x) = x^2 - \sin x$
$+ 5$
continuous at $x = \pi$?

	Watch Free Video Solution on Doubtnut
21	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 21** Discuss the continuity of the following functions: (a) $f(x) = s \in x + \cos x$ (b) $f(x) = s \in x \cos x$ (c) $f(x) = s \in x . \cos x$ Watch Free Video Solution on Doubtnut
22	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 22** Discuss the continuity of the cosine, cosecant, secant and cotangent functions. Watch Free Video Solution on Doubtnut
23	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 23** Find all points of discontinuity of f, where $f(x) = \begin{cases} \frac{\sin x}{x}, & \text{if } x < 0 \\ x + 1, & \text{if } x \geq 0 \end{cases}$ Watch Free Video Solution on Doubtnut
	
	Watch Free Video Solution on Doubtnut
	doubtnut पढ़ना हुआ आसान

24	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 24** Determine if f defined by $f(x) = \left\{ x^2 \frac{\sin 1}{x}, \right.$ $\text{if} \quad x \neq 00, \quad \text{if} \quad x$ $= 0$ Watch Free Video Solution on Doubtnut
25	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 25** Examine the continuity of f, where f is defined by $f(x) = \{\sin x$ $- \cos x, \quad \text{if} \quad x \neq 0$ $- 1, \quad \text{if} \quad x = 0$ Watch Free Video Solution on Doubtnut
26	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 26** Find the values of k so that the function f is continuous at the indicated point in $f(x)$ $= \left\{ \left(\frac{k \cos x}{\pi - 2x}, \right. \right.$ $\text{if} \quad x \neq \frac{\pi}{2} \Big),$ $\left(3 \quad \text{if} \quad x = \frac{\pi}{2} \right)$ at $x = \frac{\pi}{2}$ Watch Free Video Solution on Doubtnut
27	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 27** Find the values of k so that the function f is continuous at the indicated point in $f(x) = \left\{ kx^2, \quad \text{if} \quad x \right.$ $\leq 2, 3 \quad \text{if} \quad x > 2$ at $x \quad = \quad 2$.

	Watch Free Video Solution on Doubtnut
28	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 28** Find the values of k so that the function f is continuous at the indicated point in $f(x) = \{kx + 1,$ $\text{if} \quad x \leq \pi \quad \cos x,$ $\text{if} \quad x > \pi$ at $x \quad = \pi$ Watch Free Video Solution on Doubtnut
29	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 29** Find the values of k so that the function f is continuous at the indicated point in $f(x) = \{kx + 1,$ $\text{if} \quad x \leq 53x - 5,$ $\text{if} \quad x > 5$ at $x \quad = \quad 5$ Watch Free Video Solution on Doubtnut

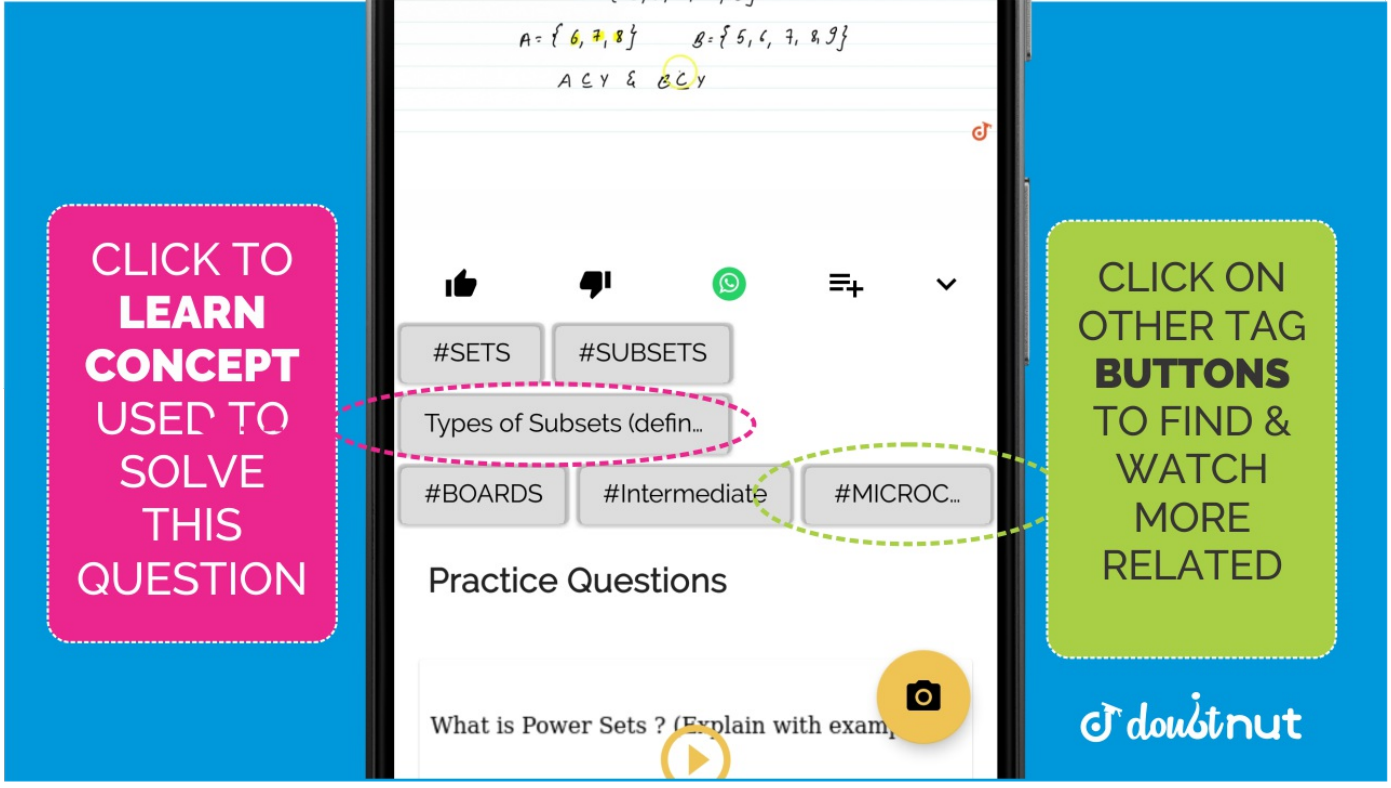
30	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 30** Find the values of a and b such that the function defined by $f(x)$ $= \{(5, \quad \text{if} \quad x \leq 2),$ $(ax + b, \quad \text{if} \quad 2 < x$ $< 10), (21, \quad \text{if} \quad x$ $\geq 10)\}$ is a continuous function. Watch Free Video Solution on Doubtnut
31	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 31** Show that the function defined by $f(x) = \cos\left(x^2\right)$ is a continuous function. Watch Free Video Solution on Doubtnut
32	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 32** Show that the function defined by $f(x)$ $= \quad \vert \quad \cos \quad x$ $\vert$ is a continuous function. Watch Free Video Solution on Doubtnut
33	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 33** Examine that sin $\vert \quad x \quad \vert$ is a continuous function. Watch Free Video Solution on Doubtnut
34	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.1 - Q 34** Find all the points of discontinuity of f defined by $f(x)$ $= \quad \vert \quad x \quad \vert$ $- \quad \vert \quad x$ $+ \quad 1 \quad \vert$.

	Watch Free Video Solution on Doubtnut
35	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.2 - Q 1** Differentiate the functions with respect to x $\sin\left(x^2+5\right)$ Watch Free Video Solution on Doubtnut
	
36	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.2 - Q 2** Differentiate the functions with respect to x $\cos(\sin x)$ Watch Free Video Solution on Doubtnut
37	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.2 - Q 3** Differentiate the functions with respect to x $\sin(ax+b)$ Watch Free Video Solution on Doubtnut
38	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.2 - Q 4** Differentiate the functions with respect to x $\sec\left(\tan\left(\sqrt{x}\right)\right)$ Watch Free Video Solution on Doubtnut
39	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.2 - Q 5** Differentiate the functions with respect to x $\left(\frac{\sin(ax+b)}{\cos(cx+d)}\right.$

	Watch Free Video Solution on Doubtnut
40	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.2 - Q 6** Differentiate the functions with respect to x $\cos x^3 \sin^2\left(x^5\right)$ Watch Free Video Solution on Doubtnut
41	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.2 - Q 7** Differentiate the functions with respect to x $2\sqrt{\cot\left(x^2\right)}$ Watch Free Video Solution on Doubtnut

42	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.2 - Q 8** Differentiate the functions with respect to x $\cos\left(\sqrt{x}\right)$ Watch Free Video Solution on Doubtnut
43	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.2 - Q 9** Prove that the function f given by $f(x) = \lvert x - 1\rvert, \quad x \in R$ is not differentiable at $x = 1$

	Watch Free Video Solution on Doubtnut
44	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.2 - Q 10** Prove that the greatest integer function defined by $f(x) = [x], 0 < x < 3$ is not differentiable at $x = 1$ and $x = 2$. Watch Free Video Solution on Doubtnut
45	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.3 - Q 1** Find $\frac{dy}{dx}$ in the following: $2x + 3y = s \in x$ Watch Free Video Solution on Doubtnut
46	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.3 - Q 2** Find $\frac{dy}{dx}$ in the following: $2x + 3y = \sin y$ Watch Free Video Solution on Doubtnut
47	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.3 - Q 3** Find $\frac{dy}{dx}$ in the following: $ax + by^2 = \cos y$ Watch Free Video Solution on Doubtnut



48	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.3 - Q 4** Find $\frac{dy}{dx}$ in the following: $xy + y^2 = tan\ x + y$ Watch Free Video Solution on Doubtnut
49	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.3 - Q 5** Find $\frac{dy}{dx}$ in the following: $x^2 + xy + y^2 = 100$ Watch Free Video Solution on Doubtnut
50	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.3 - Q 6** Find $\frac{dy}{dx}$ in the following: (a) $x^3 + x^2y + xy^2 + y^3 = 81$ (b) $xy + y^2 = \tan x + y$ (c) $x^2 + xy + y^2 = 100$ Watch Free Video Solution on Doubtnut
51	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.3 - Q 7** Find $\frac{dy}{dx}$ in the following: $\sin^2 y + \cos xy = \pi$ Watch Free Video Solution on Doubtnut

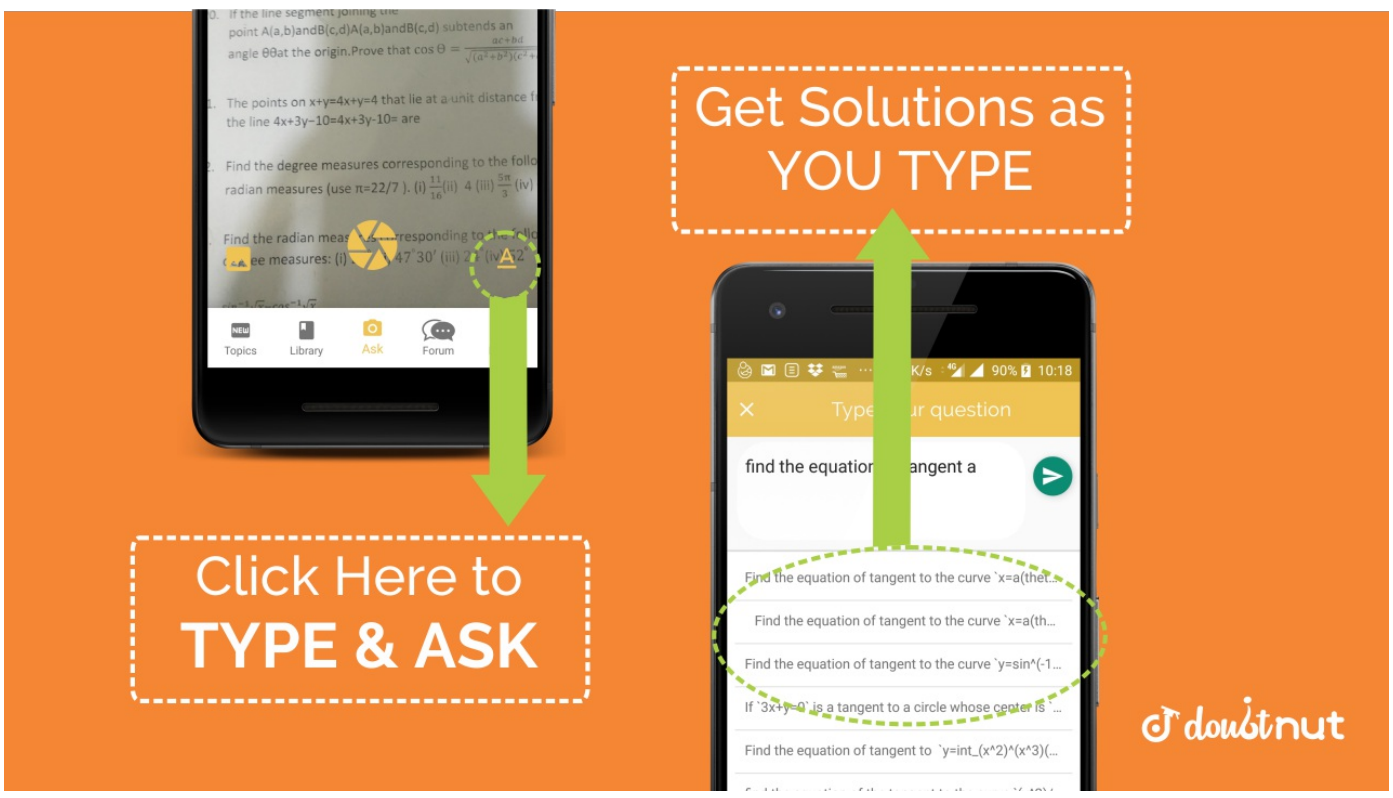
52	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.3 - Q 8** Find $\frac{dy}{dx}$ in the following: $\sin^2 x + \cos^2 y = 1$ Watch Free Video Solution on Doubtnut
53	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.3 - Q 9** Find $\frac{dy}{dx}$ in the following: y $= \sin^{-1}\left(\frac{2x}{1+x^2}\right)$ Watch Free Video Solution on Doubtnut
54	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.3 - Q 10** Find $\frac{dy}{dx}$ in the following: `y=tan^(-1)((3x-x^3)/(1-3x^2)),-1/(sqrt(3)) Watch Free Video Solution on Doubtnut
55	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.3 - Q 11** Find $\frac{dy}{dx}$ in the following: `y=cos^(-1)((1-x^2)/(1+x^2)),0 Watch Free Video Solution on Doubtnut

56	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.3 - Q 12** Find $\frac{dy}{dx}$ in the following: $y = \sin^{-1}\left(\frac{1-x^2}{1+x^2}\right)$,$0 < x < 1$ Watch Free Video Solution on Doubtnut
57	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.3 - Q 13** Find $\frac{dy}{dx}$ in the following: `y=cos^(-1)((2x)/(1+x^2)),-1 Watch Free Video Solution on Doubtnut
58	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.3 - Q 14** Find $\frac{dy}{dx}$ in the following: $y = \sin^{-1}\left(2x\sqrt{1-x^2}\right)$, $-\frac{1}{\sqrt{2}} < x < \frac{1}{\sqrt{2}}$ Watch Free Video Solution on Doubtnut
59	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.3 - Q 15** Find $\frac{dy}{dx}$ in the following: $y = \sec^{-1}\left(\frac{1}{2x^2-1}\right)$ Watch Free Video Solution on Doubtnut

60	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.4 - Q 1** Differentiate the following w.r.t. x: $\frac{e^x}{\sin x}$ Watch Free Video Solution on Doubtnut
61	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.4 - Q 2** Differentiate the following w.r.t. x: $e^{\sin -1x}$ Watch Free Video Solution on Doubtnut
62	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.4 - Q 3** Differentiate the following w.r.t. x: e^{x^3} Watch Free Video Solution on Doubtnut
63	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.4 - Q 4** Differentiate the following w.r.t. x: $\sin\left(\tan^{-1} e^{-x}\right)$ Watch Free Video Solution on Doubtnut

64	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.4 - Q 5** Differentiate the following w.r.t. x: $\log(\cos e^x)$ Watch Free Video Solution on Doubtnut
65	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.4 - Q 6** Differentiate the following w.r.t. x: $e^x + e^x \hat{} 2 + \ldots .$ $+ e^x \hat{} 5$ Watch Free Video Solution on Doubtnut
66	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.4 - Q 7** Differentiate the following w.r.t. x: $\sqrt{e^{\sqrt{x}}}, x > 0$ Watch Free Video Solution on Doubtnut
67	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.4 - Q 8** Differentiate the following w.r.t. x: $\log(\log x), x > 1$ Watch Free Video Solution on Doubtnut
68	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.4 - Q 9** Differentiate the following w.r.t. x: $\frac{\cos x}{\log x}, x > 0$

Watch Free Video Solution on Doubtnut

69	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.4 - Q 10** Differentiate the following w.r.t. x: $\cos(\log x + e^x), x$ < 0 Watch Free Video Solution on Doubtnut
70	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 1** Differentiate the functions given w.r.t. x: $\cos x \cos 2x \cos 3x$ Watch Free Video Solution on Doubtnut
71	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 2** Differentiate the functions given w.r.t. x: $\sqrt{\frac{(x-1)(x-2)}{(x-3)(x-4)(x-5)}}$ Watch Free Video Solution on Doubtnut
	
doubtnut पढ़ना हुआ आसान	
72	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 3** Differentiate the functions given w.r.t. x: $(\log x)^{\cos x}$ Watch Free Video Solution on Doubtnut

73	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 4** Differentiate the functions given w.r.t. x: $x^x - 2^{\sin x}$ Watch Free Video Solution on Doubtnut
74	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 5** Differentiate the functions given w.r.t. x: $(x$ $+ 3)^2 x + 4^3 x + 5^4$ Watch Free Video Solution on Doubtnut
75	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 6** Differentiate the functions given w.r.t. x: $\left(x + \frac{1}{x}\right)^x$ $+ x^{\left(1+\frac{1}{x}\right)}$ Watch Free Video Solution on Doubtnut
76	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 7** Differentiate the following w.r.t. x: $(\log x)^x + x^{\log x}$ Watch Free Video Solution on Doubtnut
77	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 8** Differentiate the following w.r.t. x: $(\sin x)^x + \sin^{-1}\sqrt{x}$ Watch Free Video Solution on Doubtnut
doubtnut पढ़ना हुआ आसान	

78	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 9** Differentiate the following w.r.t. x: $x^{\sin x} + (\sin x)^{\cos x}$ Watch Free Video Solution on Doubtnut
79	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 10** Differentiate the following w.r.t. x: $x^{x \cos x} + \frac{x^2 + 1}{x^2 - 1}$ Watch Free Video Solution on Doubtnut
80	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 11** Differentiate the following w.r.t. x: $(x \cos x)^x$ $+ (x \sin x)^{\frac{1}{x}}$ Watch Free Video Solution on Doubtnut
81	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 12** Find $\frac{dy}{dx}$ of the functions given $x^y + y^x = 1$ Watch Free Video Solution on Doubtnut
82	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 13**

	Find $\frac{dy}{dx}$ of the functions given $y^x = x^y$ Watch Free Video Solution on Doubtnut
83	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 14** Find $\frac{dy}{dx}$ of the functions given $(\cos x)^y = (\cos y)^x$ Watch Free Video Solution on Doubtnut
	
84	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 15** Find $\frac{dy}{dx}$ of the functions given $xy = e^{(x-y)}$ Watch Free Video Solution on Doubtnut
85	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 16** Find the derivative of the function given by $f(x) = (1+x)(1+x^2)(1+x^4)(1+x^8)$ and hence find $f'(1)$. Watch Free Video Solution on Doubtnut

86	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 17** Differentiate $\left(x^2-5x+8\right)\left(x^3+7x+9\right)$ in three ways mentioned below: (i) by using product rule (ii) by expanding the product to obtain a single polynomial. (iii) by logarithmic differentiation. Do they all give the same answer? Watch Free Video Solution on Doubtnut
87	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.5 - Q 18** If u, v and w are functions of x, then show that $\frac{d}{dx}\left(u\dot{v}\dot{w}\right)=\frac{du}{dx}v\dot{w}+u\frac{dv}{dx}\dot{w}+u\dot{v}\frac{dw}{dx}$ in two ways - first by repeated application of product rule, second by logarithmic differentiation. Watch Free Video Solution on Doubtnut
88	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.6 - Q 1** If x and y are connected parametrically by the equations given, without eliminating the parameter, Find $\frac{dy}{dx}$. $x=2at^2, y=at^4$ Watch Free Video Solution on Doubtnut
89	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.6 - Q 2** If x and y are connected parametrically by the equations given, without eliminating the parameter, Find $\frac{dy}{dx}$. $x=a\cos\theta, y=b\cos\theta$ Watch Free Video Solution on Doubtnut

90	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.6 - Q 3** If x and y are connected parametrically by the equations given, without eliminating the parameter, Find $\frac{dy}{dx}$. $x = \sin t, y = \cos 2t$ Watch Free Video Solution on Doubtnut
91	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.6 - Q 4** If x and y are connected parametrically by the equations given, without eliminating the parameter, Find $\frac{dy}{dx}$. $x = 4t, y = \frac{4}{t}$ Watch Free Video Solution on Doubtnut
92	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.6 - Q 5** If x and y are connected parametrically by the equations given, without eliminating the parameter, Find $\frac{dy}{dx}$. $x = \cos\theta - \cos 2\theta, y$ $= \sin\theta - \sin 2\theta$ Watch Free Video Solution on Doubtnut
93	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.6 - Q 6** If x and y are connected parametrically by the equations given, without eliminating the parameter, Find $\frac{dy}{dx}$. $x = a(\theta - \sin\theta), y$ $= a(1 + \cos\theta)$

Watch Free Video Solution on Doubtnut

94

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.6 - Q 7

If x and y are connected parametrically by the equations given, without eliminating the parameter, Find $\frac{dy}{dx}$.

$x = \frac{\sin^3 t}{\sqrt{\cos 2t}}, y$

$= \frac{\cos^3 t}{\sqrt{\cos 2t}}$

Watch Free Video Solution on Doubtnut

95

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.6 - Q 8

If x and y are connected parametrically by the equations given, without eliminating the parameter, Find $\frac{dy}{dx}$.

$x = a\left(\cos t\right.$

$\left. + \frac{\log \tan t}{2}\right) y$

$= a \sin t$

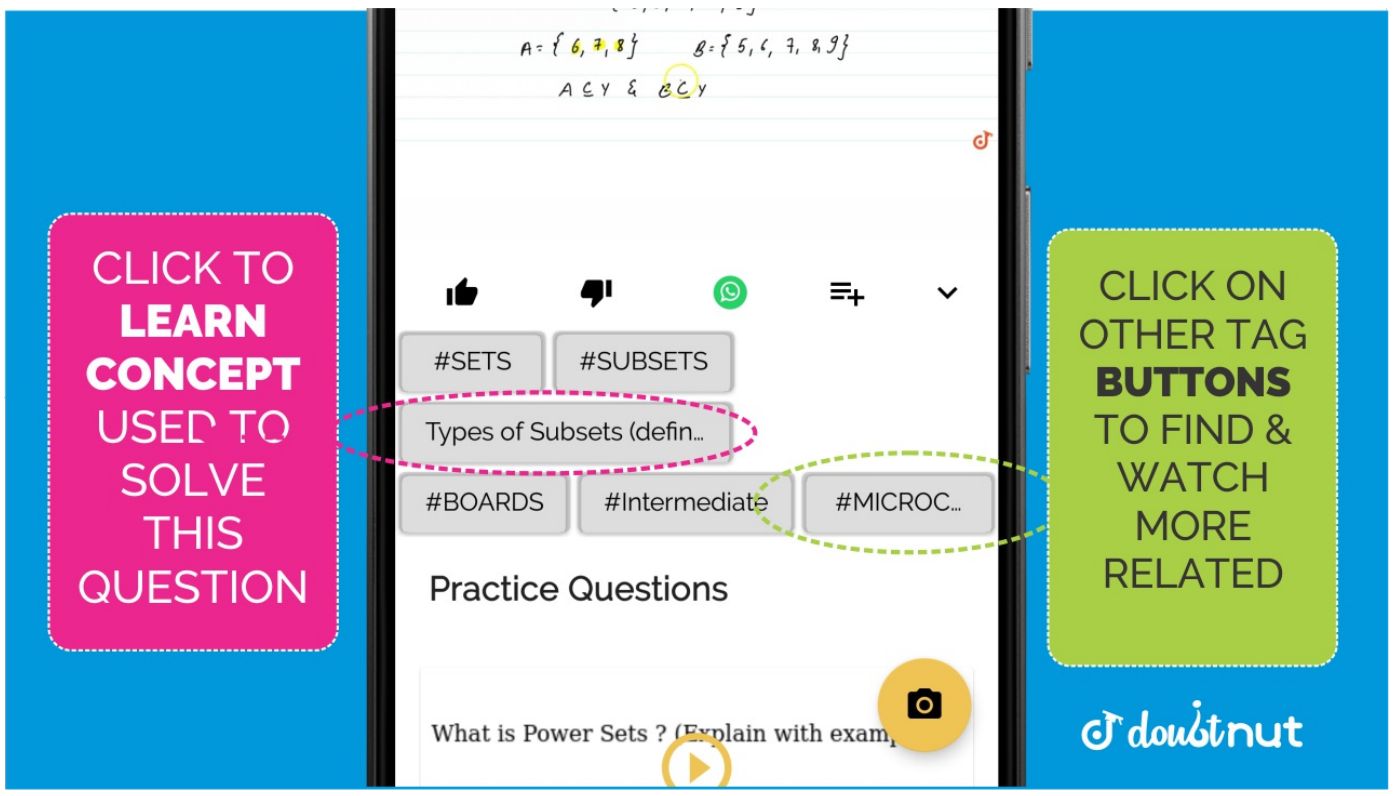
Watch Free Video Solution on Doubtnut

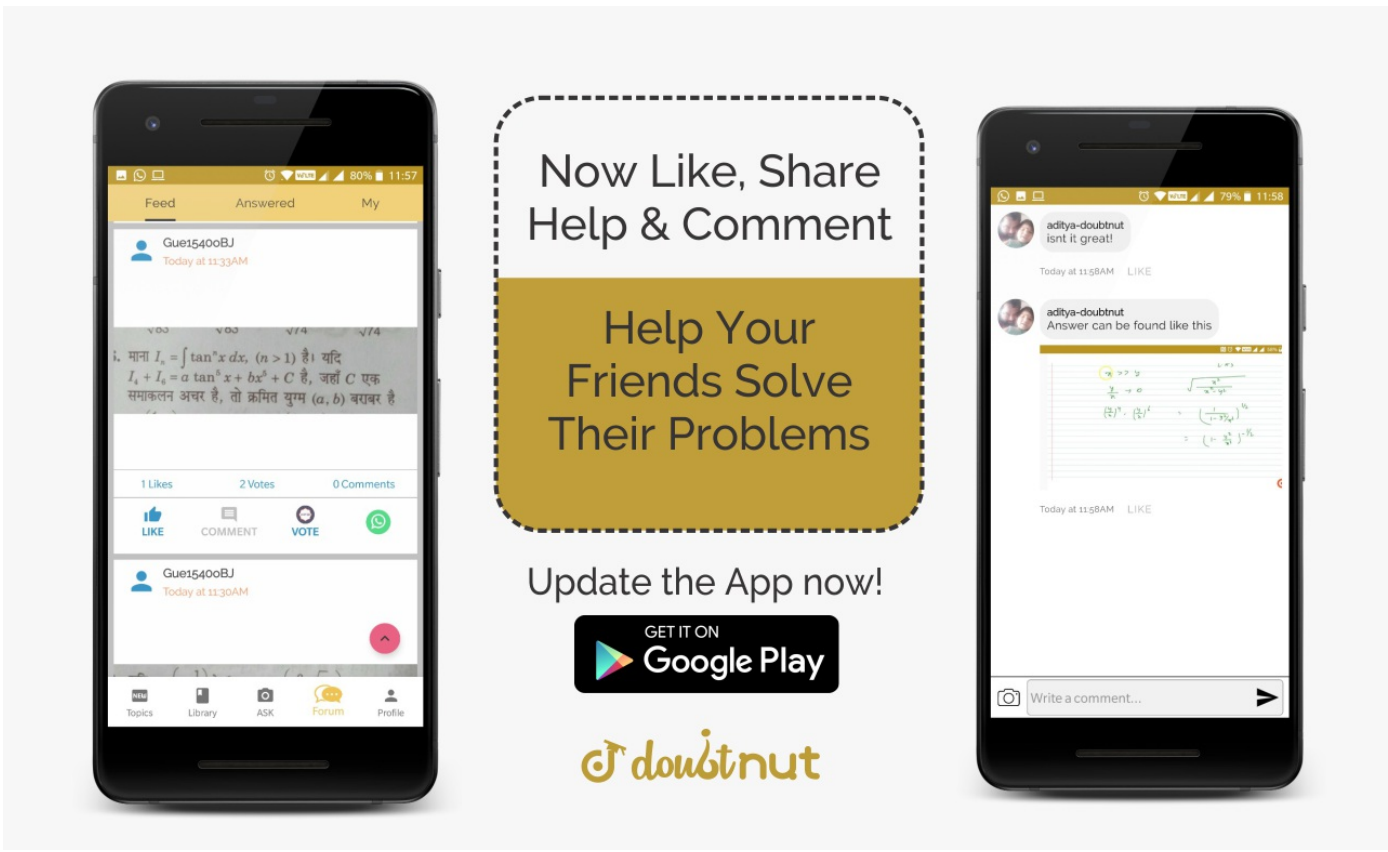
96

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.6 - Q 9

If x and y are connected parametrically by the equations given, without eliminating the parameter, Find $\frac{dy}{dx}$.

	$x = a\sec\theta, y = b\tan\theta$ Watch Free Video Solution on Doubtnut
97	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.6 - Q 10** If x and y are connected parametrically by the equations given, without eliminating the parameter, Find $\frac{dy}{dx}$. $x = a(\cos\theta + \theta\sin\theta), y = a(\sin\theta - \theta\cos\theta)$ Watch Free Video Solution on Doubtnut
98	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.6 - Q 11** If $x = \sqrt{a^{\sin\hat{}((-1)t)}}, y = \sqrt{a^{\cos\hat{}((-1)t)}}$, show that $\frac{dy}{dx} = -\frac{y}{x}$ Watch Free Video Solution on Doubtnut
99	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 1** Find the second order derivatives of the functions given $x^2 + 3x + 2$ Watch Free Video Solution on Doubtnut
100	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 2** Find the second order derivatives of the functions given. x^{20} Watch Free Video Solution on Doubtnut
	NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 3

101	Find the second order derivatives of the functions given. $x \cdot \cos x$ Watch Free Video Solution on Doubtnut
	
102	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 4** Find the second order derivatives of the functions given. $\log \quad x$ Watch Free Video Solution on Doubtnut
103	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 5** Find the second order derivatives of the functions given. $x^3 \log x$ Watch Free Video Solution on Doubtnut
104	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 6** Find the second order derivatives of the functions given. $e^x \sin 5x$. Watch Free Video Solution on Doubtnut
105	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 7** Find the second order derivatives of the functions given. $e^{6x} \cos 3x$. Watch Free Video Solution on Doubtnut
106	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 8** Find the second order derivatives of the functions given. $\tan^{-1} x$.

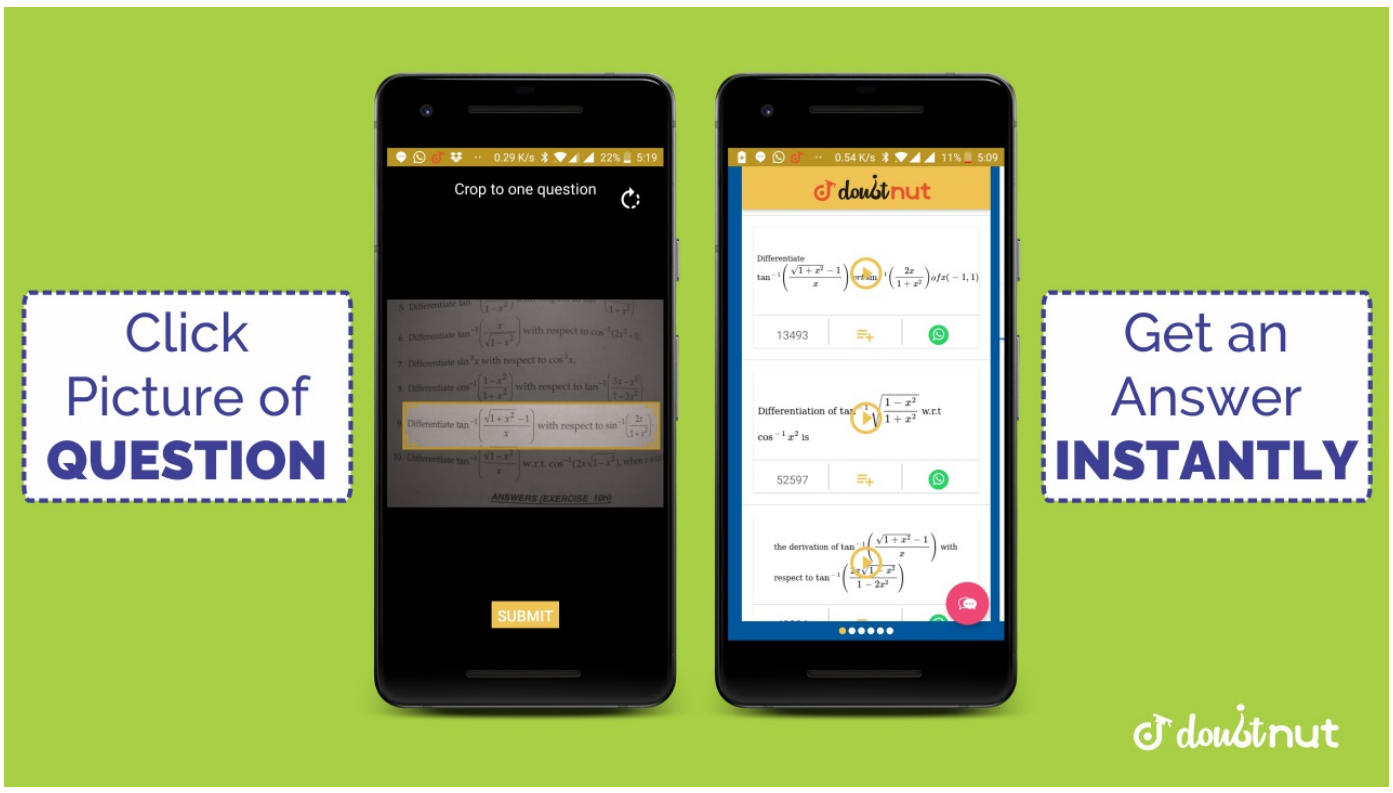
	Watch Free Video Solution on Doubtnut
107	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 9** Find the second order derivatives of the functions given. $\log \quad (\log \quad x)$ Watch Free Video Solution on Doubtnut
	
108	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 10** Find the second order derivatives of the functions given. sin(log x) Watch Free Video Solution on Doubtnut
109	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 11** If $y \quad = \quad 5$ $\cos \quad x - 3 \quad s$ $\in \quad x$, prove that $\frac{d^2y}{dx^2} + y = 0$ Watch Free Video Solution on Doubtnut
110	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 12** If $y = \cos^{-1} x,$ Find $\frac{d^2y}{dx^2}$ in terms of y alone.

	Watch Free Video Solution on Doubtnut
111	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 13** If $y = 3\cos(\log x) + 4\sin(\log x)$, show that $x^2 y_2 + x y_1 + y = 0$. Watch Free Video Solution on Doubtnut
112	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 14** If $y = Ae^{mx} + Be^{nx}$, show that $\frac{d^2y}{dx^2} - (m+n)\frac{dy}{dx} + mny = 0$ Watch Free Video Solution on Doubtnut
113	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 15** If $y = 500e^{7x} + 600e^{-7x}$, show that $\frac{d^2y}{dx^2} = 49y$ Watch Free Video Solution on Doubtnut

114	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 16** If $e^y(x+1)=1$, show that $\frac{d^2y}{dx^2}=\left(\frac{dy}{dx}\right)^2$. Watch Free Video Solution on Doubtnut
115	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.7 - Q 17** If $y=\left(\tan^{-1}x\right)^2$, show that $\left(x^2+1\right)^2y_2+2x\left(x^2$ $+1\right)y_1=2$ Watch Free Video Solution on Doubtnut
116	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.8 - Q 1** Verify Rolles theorem for the function $f(x)=x^2+2x$ $-8,$ $x\in[-4,2]$. Watch Free Video Solution on Doubtnut
117	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.8 - Q 2** Examine if Rolles theorem is applicable to any of the following functions. Can you say something about the converse of Rolles theorem from these example? (i) $f(x)=[x]$ for $x\in[5,9]$ (ii) $f(x)\quad=\quad[x]$ for $x\in[-2,2]$ (iii) `f(x)=x^ Watch Free Video Solution on Doubtnut
118	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.8 - Q 3** If $f\quad:\quad[\quad5,\quad5]R$ is a differentiable function and if $f'(x)$ does not vanish anywhere, then prove that $f(\quad5)f(5)$. Watch Free Video Solution on Doubtnut
119	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.8 - Q 4** Verify Mean Value Theorem, if $f(x)=x^2-4x-3$ in the interval [a, b], where $a\quad=\quad1\quad and$ $b\quad=\quad4$

.

Watch Free Video Solution on Doubtnut



120

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.8 - Q 5

Verify Mean Value Theorem, if $f(x) = x^3 - 5x^2 - 3x$ in the interval [a, b], where $a = 1$ and $b = 3$. Find all $c \in (1, 3)$ for which $f'(c) = 0$.

Watch Free Video Solution on Doubtnut

121

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - EXERCISE 5.8 - Q 6

Examine the applicability of Mean Value Theorem for all three functions given in the above exercise 2.

Watch Free Video Solution on Doubtnut

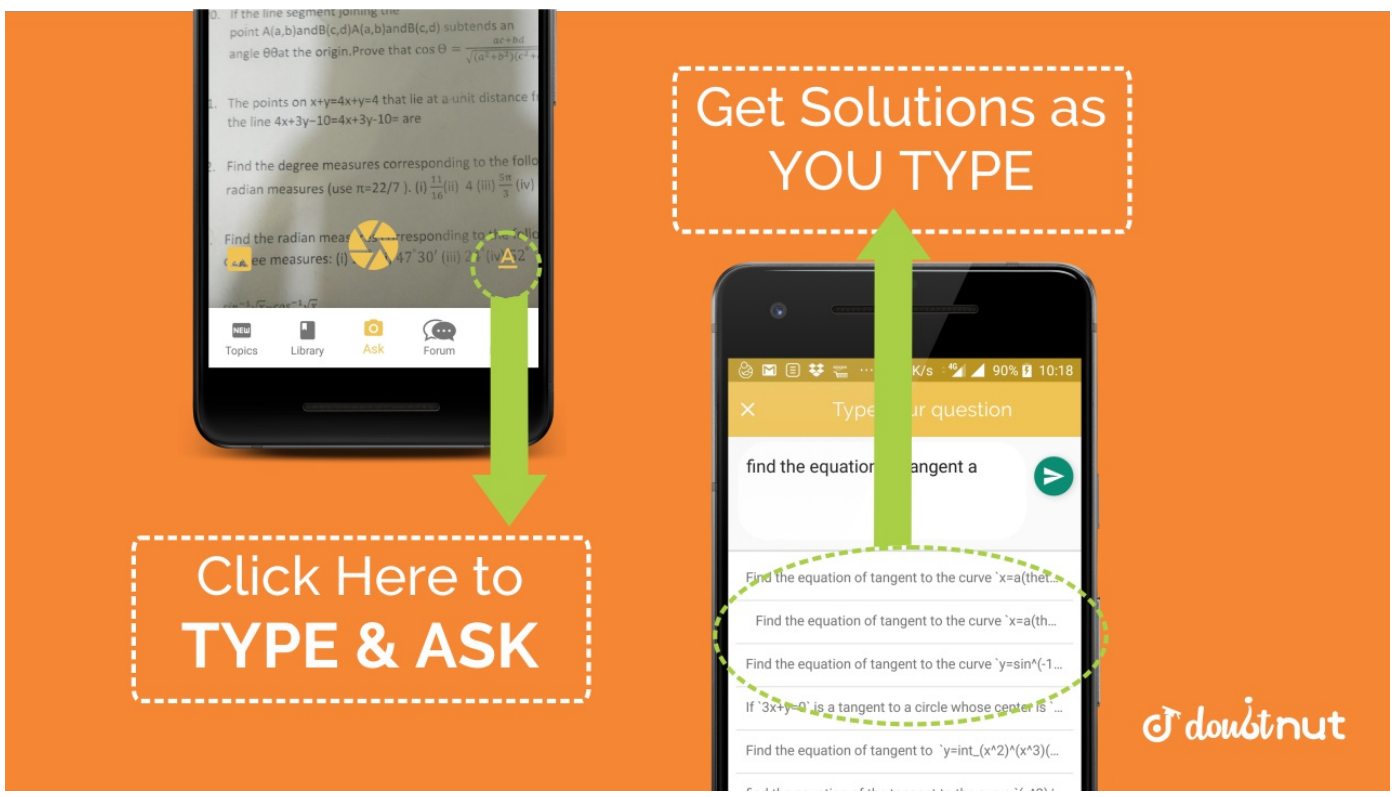
122

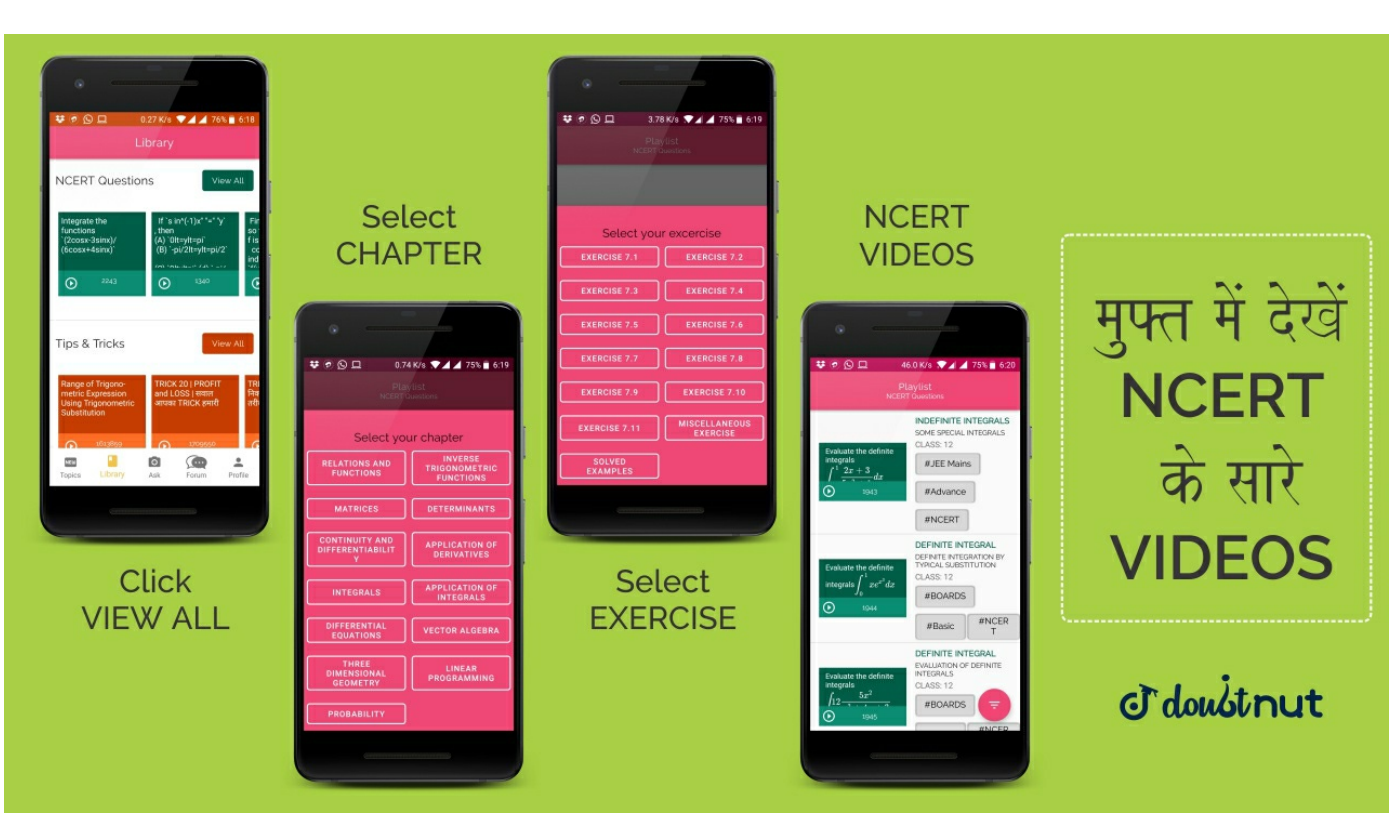
NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 1

Differentiate w.r.t. x the function. $\left(3x^2 - 9x + 5\right)^9$

Watch Free Video Solution on Doubtnut

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY -

123	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 2** Differentiate w.r.t. x the function $\sin^3 x + \cos^6 x$ Watch Free Video Solution on Doubtnut
124	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 3** Differentiate w.r.t. x the function $(5x)^{3\cos 2x}$. Watch Free Video Solution on Doubtnut
125	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 4** Differentiate w.r.t. x the function $\sin^{-1}\left(x\sqrt{x}\right), 0 \leq x \leq 1$ Watch Free Video Solution on Doubtnut
	
126	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 5** Differentiate w.r.t. x the function $\frac{\cos^{-1}\left(\frac{x}{2}\right)}{\sqrt{2x+7}}$, $-2 < x < 2$ Watch Free Video Solution on Doubtnut
127	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 6** Differentiate w.r.t. x the function `cot^(-1)(sqrt(1+sinx)+sqrt(1-sinx))/(sqrt(1+sinx)-sqrt(1-sinx)),0 Watch Free Video Solution on Doubtnut

128	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 7** Differentiate w.r.t. x the function $(\log x)^{\log x}$, $x > 1$ Watch Free Video Solution on Doubtnut
129	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 8** Differentiate w.r.t. x the function $\cos \quad (a \cos x$ $+ b \sin x)$, for some constant a and b. Watch Free Video Solution on Doubtnut
130	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 9** Differentiate w.r.t. x the function `(sinx-cosx)^((sinx-cosx)),pi/4 Watch Free Video Solution on Doubtnut
131	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 10** Differentiate w.r.t. x the function $x^x + x^a + a^x + a^a$, for some fixed $a > 0$ and $x > 0$. Watch Free Video Solution on Doubtnut
doubtnut पढ़ना हुआ आसान	
	NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 11

132	Differentiate w.r.t. x the function $x^x \hat{} (2-3) + (x-3)^x \hat{} 2$ for $x > 3$. Watch Free Video Solution on Doubtnut
133	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 12** Find $\frac{dy}{dx}$, if `y=12(1-cost), x=10(t-sint),-pi/2 Watch Free Video Solution on Doubtnut
134	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 13** Find $\frac{dy}{dx}$, if $y = \sin^{-1} x + \sin^{-1}\sqrt{1-x^2}, -1 \leq x \leq 1$. Watch Free Video Solution on Doubtnut
135	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 14** If $x\sqrt{1+y} + y\sqrt{1+x} = 0$, for, `-1 Watch Free Video Solution on Doubtnut
136	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 15** If $(x-a)^2 + (y-b)^2 = c^2$, for some $c > 0$, prove that $\frac{\left[1+\left(\frac{dy}{dx}\right)^2\right]^{\frac{3}{2}}}{\frac{d^2y}{dx^2}}$ is a constant independent of a and b. Watch Free Video Solution on Doubtnut
	NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 16

137

If $\cos \quad y \quad = \quad x \quad \cos \quad (a \quad + \quad y)$, with $\cos \quad a \neq \pm 1$, prove that $\frac{dy}{dx} = \left(\frac{\cos^2(a+y)}{\sin a} \right)$.

Watch Free Video Solution on Doubtnut

doubtnut
पढ़ना हुआ आसान

138

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 17

If $x \quad = \quad a \quad (\cos \quad t \quad + \quad t \quad \sin \quad t)$ and $y \quad = \quad a \quad (\sin \quad t \quad t \quad \cos \quad t)$, find $\frac{d^2y}{dx^2}$.

Watch Free Video Solution on Doubtnut

139

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 18

If $f(x) = |x|^3$, show that f^x exists for all real x and find it.

Watch Free Video Solution on Doubtnut

140	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 19** Using mathematical induction prove that $\frac{d}{dx}(x^n) = nx^{n-1}$ for all positive integers n. Watch Free Video Solution on Doubtnut
141	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 20** Using the fact that $s \in (A + B)$ $= s \in A$ $\cos B$ $+ \cos A s$ $\in B$ and the differentiation, obtain the sum formula for cosines. Watch Free Video Solution on Doubtnut
142	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 21** Does there exist a function which is continuous everywhere but not differentiable at exactly two points? Justify your answer. Watch Free Video Solution on Doubtnut
143	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 22** If y $= \|f(x)g(x)h(x$ $)lmnabc\|$, prove that $\frac{dy}{dx} = \|f'(x)g'(x)h$ $'(x)lmnabc\|$ Watch Free Video Solution on Doubtnut

144	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - MISCELLANEOUS EXERCISE - Q 23** If $y = e^{a}\cos^{(-1)x}$, $-1 \leq x \leq 1$, show that $(1-x^2)\frac{d^2y}{dx^2} - x\frac{dy}{dx} - a^2y = 0$. Watch Free Video Solution on Doubtnut
145	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 1** Check the continuity of the function f given by $f(x) = 2x + 3$ at $x = 1$. Watch Free Video Solution on Doubtnut
146	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 2** Examine whether the function f given by $f(x) = x^2$ is continuous at $x = 0$. Watch Free Video Solution on Doubtnut
147	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 3** Discuss the continuity of the function f given by $f(x) = \|x\|$ at $x = 0$. Watch Free Video Solution on Doubtnut

.

Watch Free Video Solution on Doubtnut

148

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 4

Show that the function f given by
$f(x) = \{x^3 + 3$
$\text{if} \quad x \neq 0 \quad 1 \quad \text{if} \quad x$
$= 0$
is not continuous at $x \quad = \quad 0$.

Watch Free Video Solution on Doubtnut

149

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 5

Check the points where the constant function $f(x) \quad = \quad k$ is continuous.

Watch Free Video Solution on Doubtnut

150

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 6

Prove that the identity function on real numbers given by $f(x) \quad = \quad x$ is continuous at every real number.

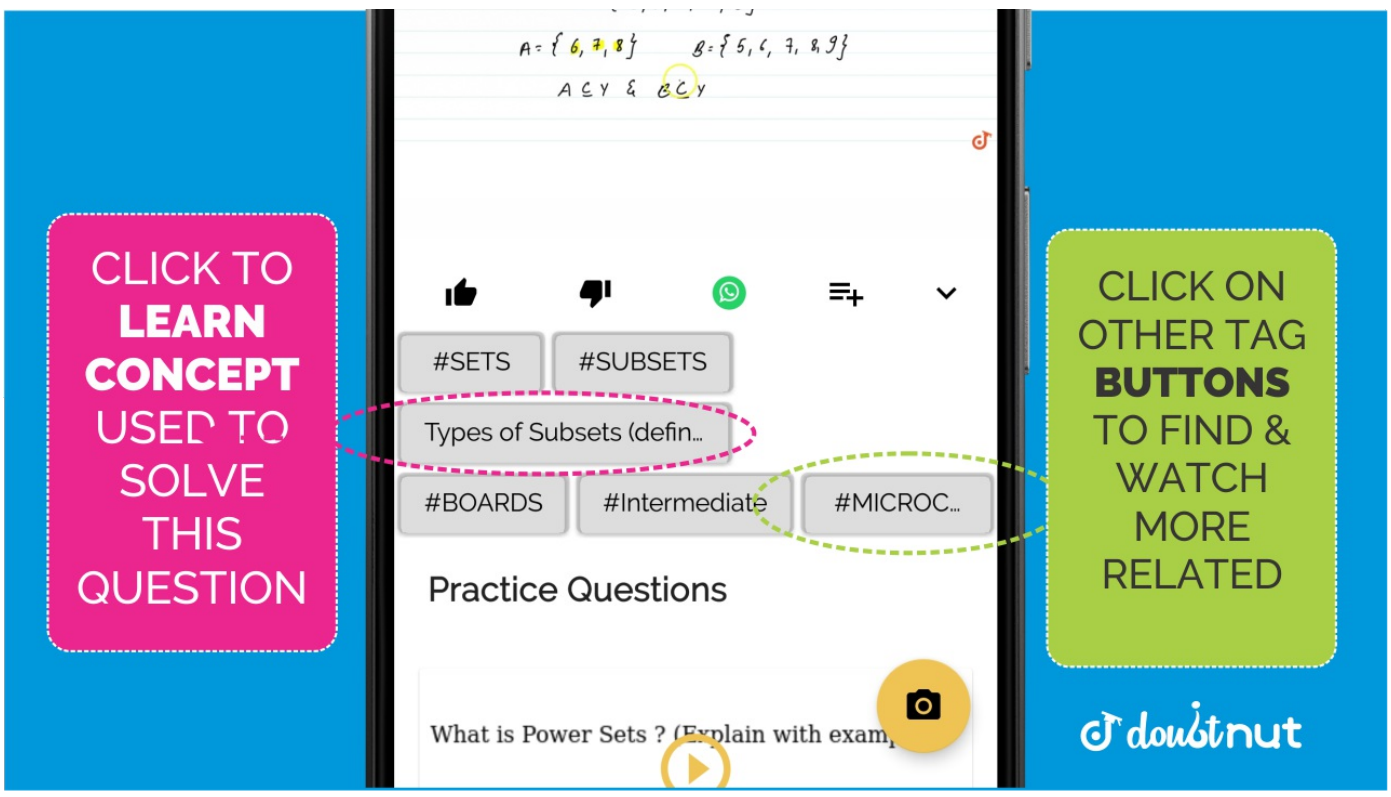
Watch Free Video Solution on Doubtnut

151

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 7

Is the function defined by $f(x) \quad = \quad |\mathrm{x}|$, a continuous function?

Watch Free Video Solution on Doubtnut

152	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 8** Discuss the continuity of the function/given by $f(x) = x^3 + x^2 - 1$. Watch Free Video Solution on Doubtnut
153	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 9** Discuss the continuity of the function f defined by $f(x) = \frac{1}{x}, x \neq 0$. Watch Free Video Solution on Doubtnut
154	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 10** Discuss the continuity of the function f defined by $f(x) = \{x + 2$ $\text{if} \quad x \leq 1x - 2 \quad \text{if} \quad x$ > 1 Watch Free Video Solution on Doubtnut
155	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 11** Find all the points of discontinuity of the function f defined by $f(x) = \{x + 2,$ $\text{if} \quad x < 10 \quad \text{if} \quad x$ $= 1x - 2 \quad \text{if} \quad x$ > 1 Watch Free Video Solution on Doubtnut
	Watch Free Video Solution on Doubtnut
doubtnut पढ़ना हुआ आसान	

156	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 12** Discuss the continuity of the function defined by $f(x) = \{x + 2,$ if $x < 0 - x + 2,$ if $x > 0$ Watch Free Video Solution on Doubtnut
157	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 13** Discuss the continuity of the function f given by $f(x) = \{x,$ if $x \geq 0x^2,$ if $x < 0$ Watch Free Video Solution on Doubtnut
158	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 14** Show that every polynomial function is continuous. Watch Free Video Solution on Doubtnut
159	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 15** Find all the points of discontinuity of the greatest integer function defined by $f(x) = [x]$, where [x] denotes the greatest integer less than or equal to x. Watch Free Video Solution on Doubtnut
160	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 16** Prove that every rational function is continuous. Watch Free Video Solution on Doubtnut
161	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 17** Discuss the continuity of sine function. Watch Free Video Solution on Doubtnut

162	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 18** Prove that the function defined by $f(x) = tan x$ is a continuous function. Watch Free Video Solution on Doubtnut
163	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 19** Show that the function defined by $f(x) = \sin(x^2)$ is a continuous function. Watch Free Video Solution on Doubtnut
164	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 20** Show that the function f defined by $f(x) = \|1 - x\| + \|x\|$, where x is any real number, is a continuous function. Watch Free Video Solution on Doubtnut
165	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 21** Find the derivative of the function given $by \quad f(x) = \sin(x^2)$. Watch Free Video Solution on Doubtnut

166

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 22

Find the derivative of $\tan(2x + 3)$.

Watch Free Video Solution on Doubtnut

167

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 23

Differentiate $\sin(\cos(x^2))$ with respect to x.

Watch Free Video Solution on Doubtnut

168

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 24

Find $\frac{dy}{dx}$ if $x - y = \pi$

Watch Free Video Solution on Doubtnut

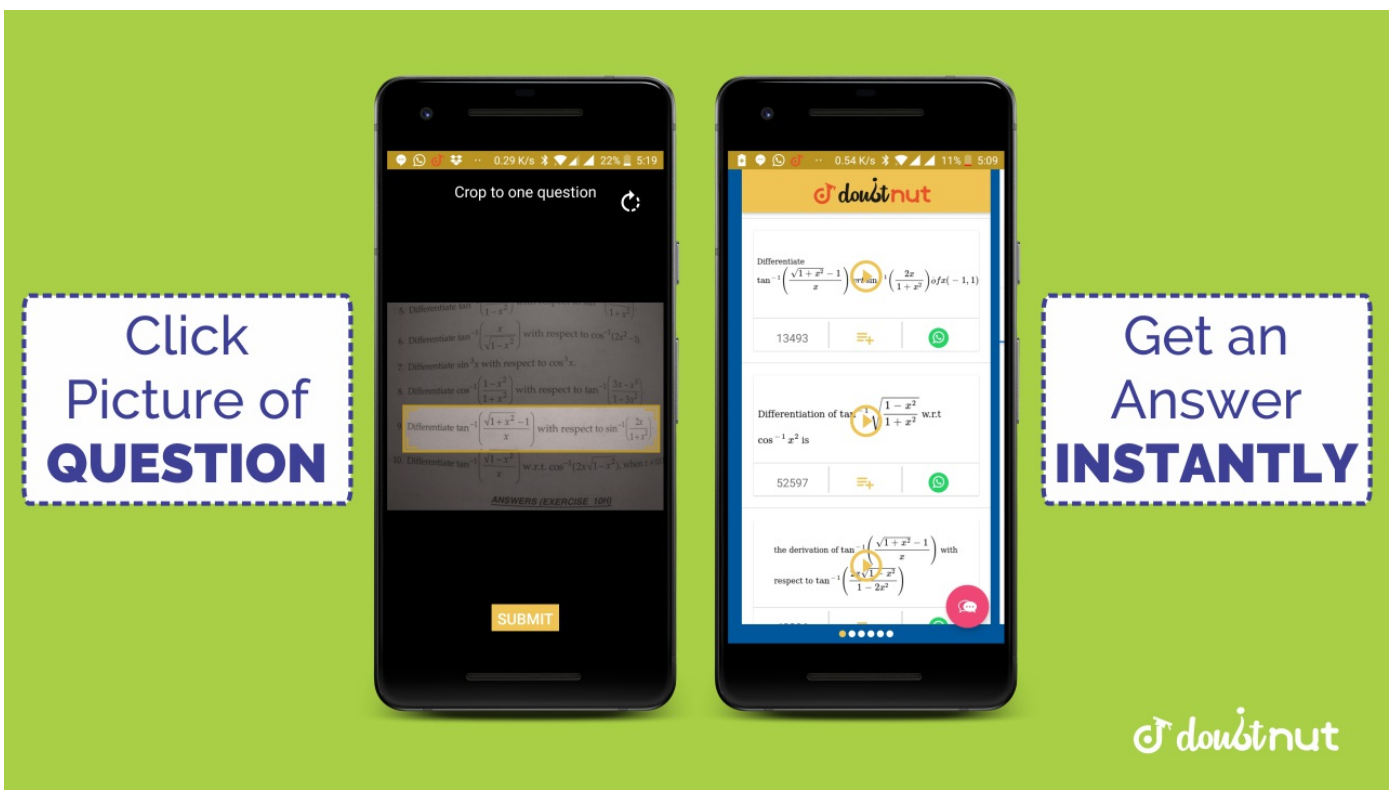
169

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 25

Find $\frac{dy}{dx}$, if $y + \sin y = \cos x$

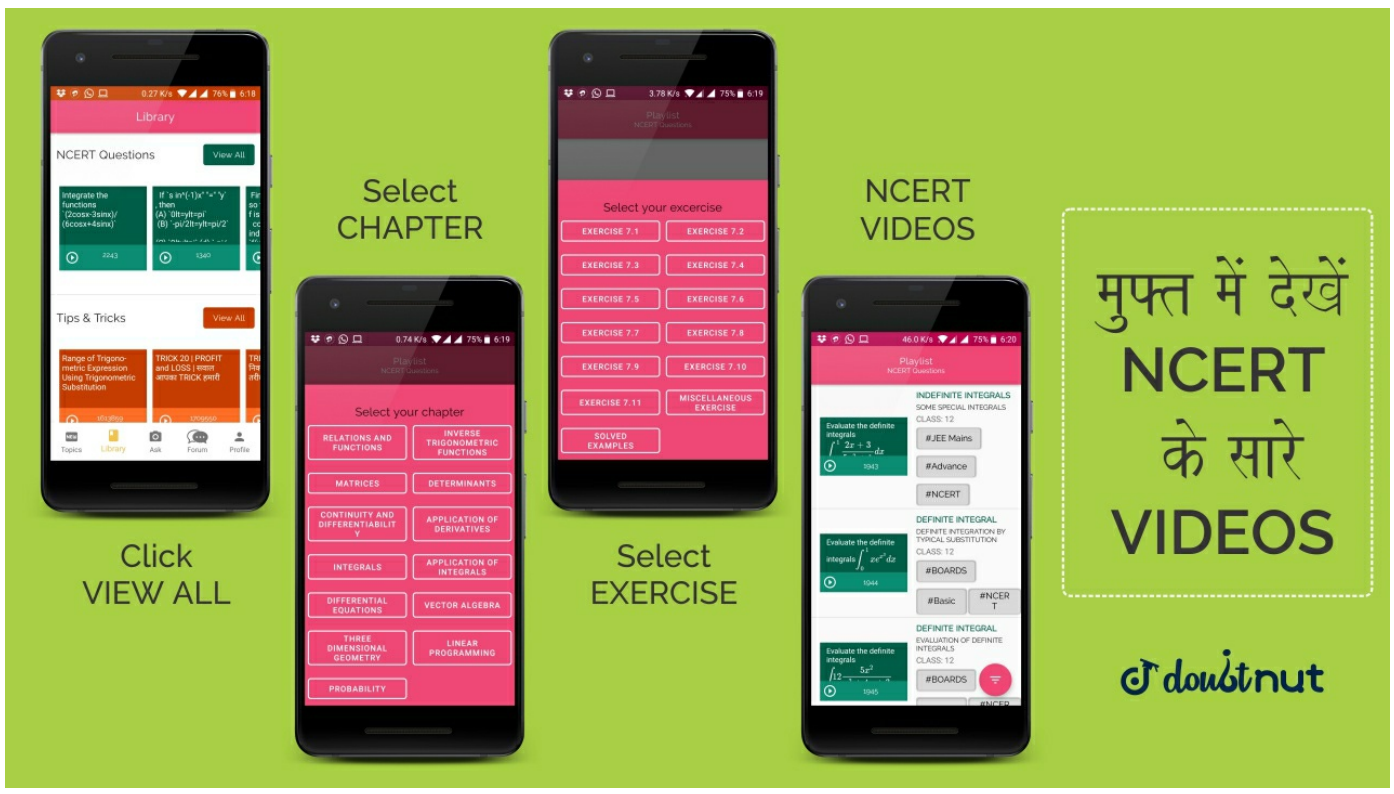
Watch Free Video Solution on Doubtnut

NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 26

170	Find the derivative of f given by $f(x) = \sin^{-1} x$ assuming it exists. Watch Free Video Solution on Doubtnut
171	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 27** Find the derivative of / given by $f(x) = \tan^{-1} x$ assuming it exists. Watch Free Video Solution on Doubtnut
172	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 28** Is it true that $x = e^{\log x}$ for all real Watch Free Video Solution on Doubtnut
173	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 29** Differentiate the following w.r.t. x: (i) e^{-x} (ii) $\sin \quad (\log \quad x)$, $x \quad > \quad 0$ (iii) $\cos^{-1}(e^x)$ (iv) $e^{\cos x}$ Watch Free Video Solution on Doubtnut
doubtnut पढ़ना हुआ आसान	
174	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 30** Differentiate $\sqrt{\frac{(x-3)(x^2+4)}{3x^2+4x+5}}$ w.r.t x. Watch Free Video Solution on Doubtnut

175	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 31** Differentiate a^x w.r.t. x, where a is a positive constant. Watch Free Video Solution on Doubtnut
176	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 32** Differentiate $x^{\sin x}, x > 0$ w.r.t. x. Watch Free Video Solution on Doubtnut
177	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 33** Find $\frac{dy}{dx}$, if $y^x + x^y + x^x = a^b$. Watch Free Video Solution on Doubtnut
178	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 34** Find $\frac{dy}{dx}$, if $x = a\cos\theta, y$ $= a\sin\theta$. Watch Free Video Solution on Doubtnut
179	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 35** Find $\frac{dy}{dx}$, if $x = at^2, y = 2at$. Watch Free Video Solution on Doubtnut
	

	NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 36
180	Find $\frac{dy}{dx}$, if $x = a(\theta + \sin\theta), y = 1(1 - \cos\theta)$. Watch Free Video Solution on Doubtnut
	NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 37
181	Find $\frac{dy}{dx}$, if $x^{\frac{2}{3}} + y^{\frac{2}{3}} = a^{\frac{2}{3}}$. Watch Free Video Solution on Doubtnut
	NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 38
182	Find $\frac{d^2y}{dx^2}$, if $y = x^3 + \tan x$. Watch Free Video Solution on Doubtnut
	NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 39
183	If $y = A \sin x + B \cos x$, then prove that $\frac{d^2y}{dx^2} + y = 0$. Watch Free Video Solution on Doubtnut

184	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 40** If $y = 3e^{2x} + 2e^{3x}$. Prove that $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = 0$. Watch Free Video Solution on Doubtnut
185	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 41** If $y = \sin^{-1} x$, show that $\left(1 - x^2\right)\frac{d^2y}{dx^2} - x\frac{dy}{dx} = 0$. Watch Free Video Solution on Doubtnut
	
186	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 42** Verify Rolle"s theorem for the function $y = x^2 + 2, a = -2$ and $b = 2$. Watch Free Video Solution on Doubtnut
187	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 43** Verify the Mean Value Theorm for f(x)=x^2 in the interval [2,4].

Watch Free Video Solution on Doubtnut

188	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 44** Differentiate the following w.r.t x. (i) $\sqrt{3x+2}$ $+\left(\frac{1}{\sqrt{2x^2+4}}\right)$ (ii) $e^{\sec^2(x)}+3\cos^{-1}(x)$ (iii) $\log_7(\log x)$ Watch Free Video Solution on Doubtnut
189	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 45** Find $f'(x)$ if $f(x)=(\sin x)^{\sin x}$ for all `0 Watch Free Video Solution on Doubtnut
190	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 46** Find df/dx if f(x) = (sin x) ^ sin x for all $o<x<\pi$. Watch Free Video Solution on Doubtnut
191	**NCERT - CLASS 12 - CHAPTER 5 CONTINUITY AND DIFFERENTIABILITY - SOLVED EXAMPLES - Q 47** Differentiate $\sin^2 x$ w.r.t $e^{\cos x}$. Watch Free Video Solution on Doubtnut