NCERT MATHS SOLUTIONS

Class - 12 || DIFFERENTIAL EQUATIONS

Ques No.	Question
1	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.1 - Q 1** Determine order and degree (if defined) of differential equations given $\frac{d^4y}{dx^4} + \sin(y'') = 0$ Watch Free Video Solution on Doubtnut
2	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.1 - Q 2** Determine order and degree (if defined) of differential equations given $y' + 5y = 0$ Watch Free Video Solution on Doubtnut
3	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.1 - Q 3** Determine order and degree (if defined) of differential equations given $\left(\frac{ds}{dt}\right)^4 + 3s\frac{d^2s}{dt^2} = 0$ Watch Free Video Solution on Doubtnut
4	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.1 - Q 4** Determine order and degree (if defined) of differential equations given $\left(\frac{d^2y}{dx^2}\right)^2 + \cos\left(\frac{dy}{dx}\right) = 0$ Watch Free Video Solution on Doubtnut
5	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.1 - Q 5** Determine order and degree (if defined) of differential equations given

$$\frac{d^2y}{dx^2} = \cos 3x + \sin 3x$$

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6

NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.1 - Q 6

Determine order and degree (if defined) of differential equations given $(y^m)^2 + (y'')^3 + (y')^4 + y^5 = 0$

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NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.1 - Q 7

Determine order and degree (if defined) of differential equations given $y^m + 2y'' + y' = 0$

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NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.1 - Q 8

Determine order and degree (if defined) of differential equations given $y' + y = e^x$

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9

NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.1 - Q 9

Determine order and degree (if defined) of differential equations given $y'' + (y')^2 + 2y = 0$

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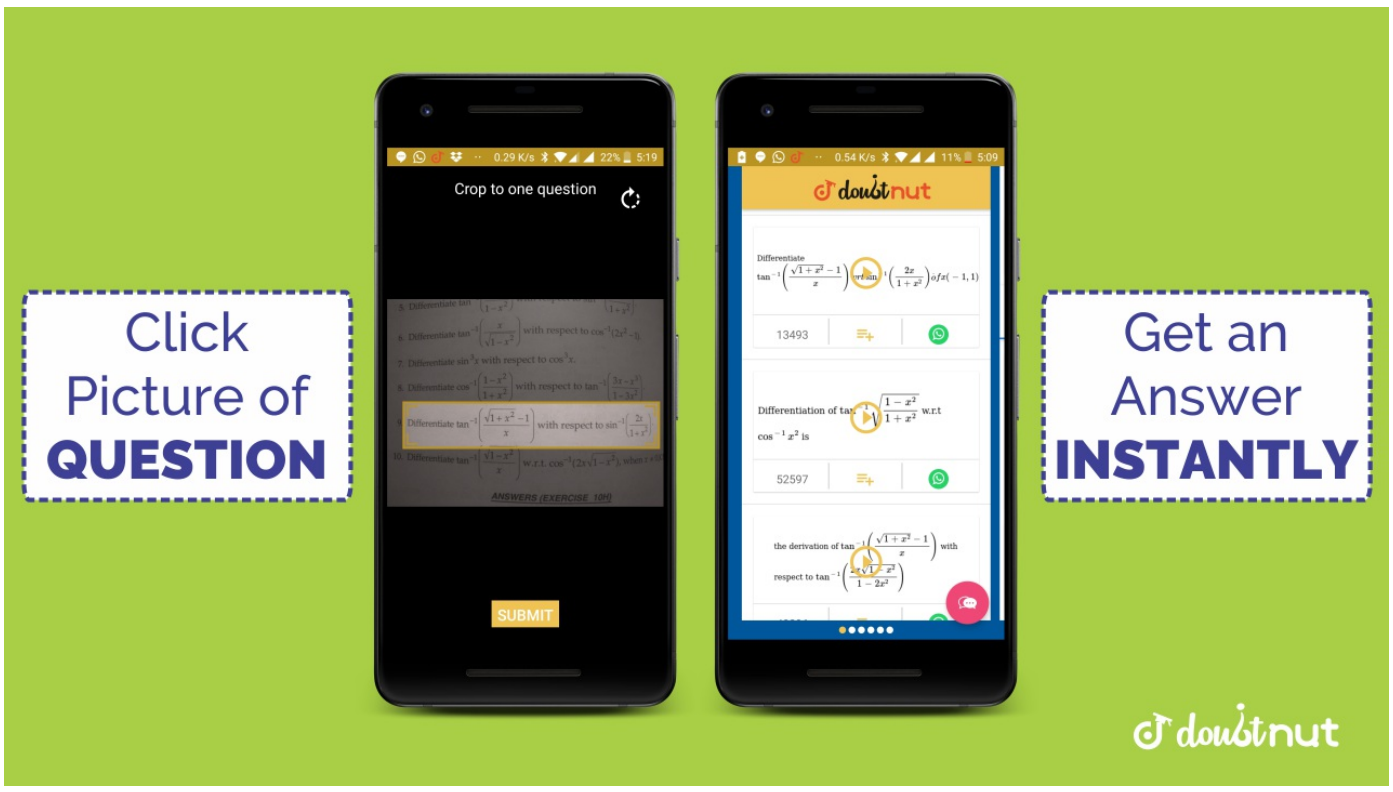
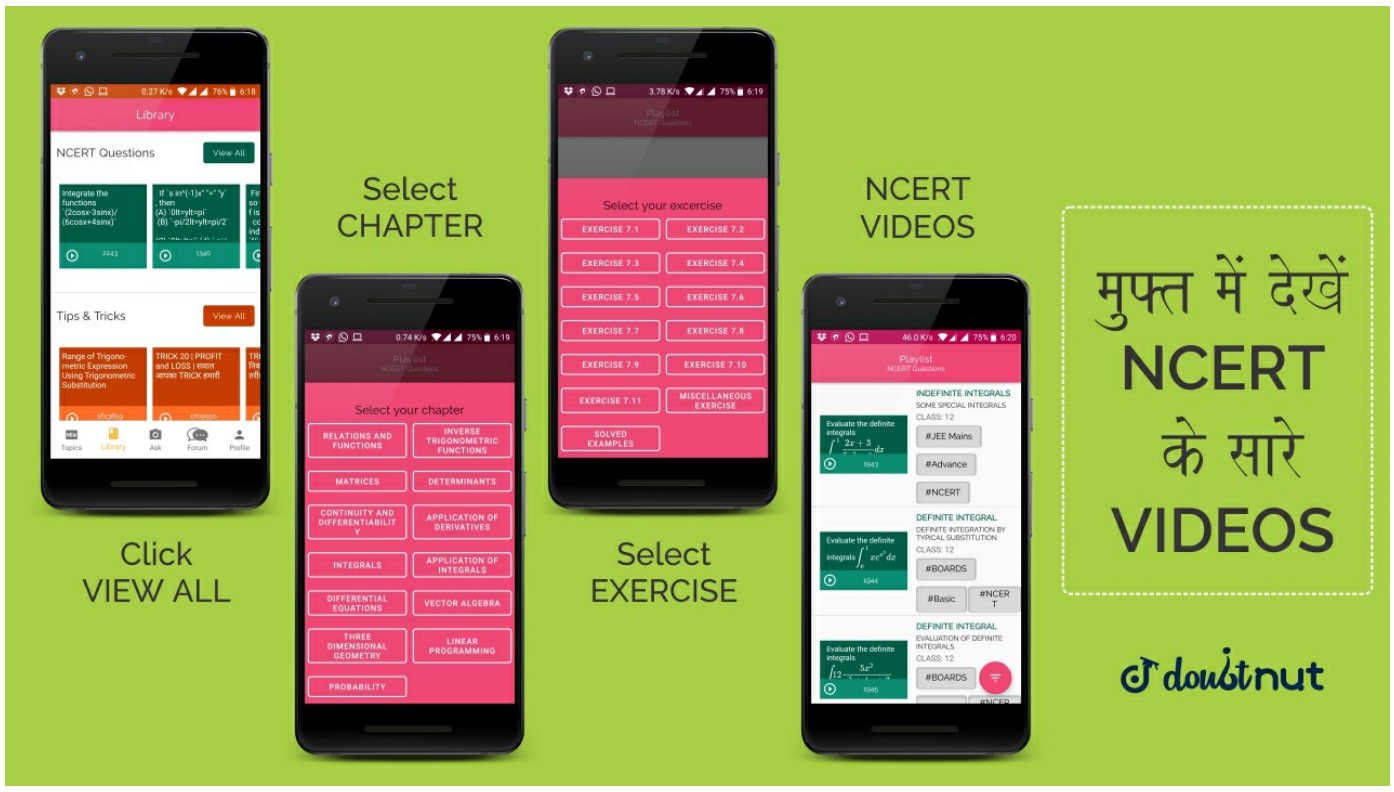
10	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.1 - Q 10** Determine order and degree (if defined) of differential equations given $y'' + 2y' + \sin y = 0$ Watch Free Video Solution on Doubtnut
11	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.1 - Q 11** The degree of the differential equation $\left(\frac{d^2y}{dx^2}\right)^3 + \left(\frac{dy}{dx}\right)^2$ $+ \sin\left(\frac{dy}{dx}\right) + 1 = 0$ (A) 3 (B) 2 (C) 1 (D) not defined Watch Free Video Solution on Doubtnut
	
12	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.1 - Q 12** The order of the differential equation $2x^2\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + y = 0$ is (A) 2 (B) 1 (C) 0 (D) not defined Watch Free Video Solution on Doubtnut
13	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.2 - Q 1** Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation: $y = e^x + 1 : y'' - y' = 0$ Watch Free Video Solution on Doubtnut

14	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.2 - Q 2** Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation: (2)$y = x^2 + 2x + C : y' - 2x - 2 = 0$ (3) $y = \cos x + c : y' + \sin x$ $= 0$ Watch Free Video Solution on Doubtnut
15	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.2 - Q 3** Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation: $y = \cos x + C : y' + \sin x = 0$ Watch Free Video Solution on Doubtnut
16	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.2 - Q 4** Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation: $y = \sqrt{1 + x^2} : y' = \frac{xy}{1 + x^2}$ Watch Free Video Solution on Doubtnut
17	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.2 - Q 5** Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation: 'y=sqrt(1+x^2) : y'=xy/1+x^2' $y = Ax : xy' = y(x \neq 0)$ Watch Free Video Solution on Doubtnut

18	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.2 - Q 6** Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation: $y = x \quad s \in x$: $xy' = y + x\sqrt{x^2 - y^2}(x$ $\neq 0$ and $x > y \quad \text{or} \quad x$ $< y$) Watch Free Video Solution on Doubtnut
19	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.2 - Q 7** Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation: $xy = \log y$ $+ C$ $: y' = \frac{y^2}{1 - xy}(xy \neq 1)$ Watch Free Video Solution on Doubtnut
20	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.2 - Q 8** Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation: $y \cos y = x$: (y sin y + cos y + x) y = y Watch Free Video Solution on Doubtnut
21	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.2 - Q 9** Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation: $x + y = \tan^{-1} y : y^2 y' + y^2 + 1 = 0$ Watch Free Video Solution on Doubtnut
	NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.2 - Q 10 Verify that the given functions (explicit or implicit) is a solution of the corresponding

22	differential equation: $y = \sqrt{a^2 - x^2}x$ $\in (-x, a)$ $: x + y\frac{dy}{dx} = 0(y \neq 0)$ Watch Free Video Solution on Doubtnut
23	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.2 - Q 11** The number of arbitrary constants in the general solution of a differential equation of fourth order are: (A) 0 (B) 2 (C) 3 (D) 4 Watch Free Video Solution on Doubtnut
	
24	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.2 - Q 12** The number of arbitrary constants in the particular solution of a differential equation of third order are: (A) 3 (B) 2 (C) 1 (D) 0 Watch Free Video Solution on Doubtnut
25	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.3 - Q 1** Form a differential equation representing the given family of curves by eliminating arbitrary constants a and b. $\frac{x}{a} + \frac{y}{b} = 1$ Watch Free Video Solution on Doubtnut
26	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.3 - Q 2** Form a differential equation representing the given family of curves by eliminating arbitrary constants a and b. $y^2 = a\left(b^2 - x^2\right)$

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27	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.3 - Q 3** Form a differential equation representing the given family of curves by eliminating arbitrary constants a and b. $y = ae^{3x} + be^{-2x}$ Watch Free Video Solution on Doubtnut
28	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.3 - Q 4** Form a differential equation representing the given family of curves by eliminating arbitrary constants a and b. $y = e^{2x}(a + bx)$ Watch Free Video Solution on Doubtnut
29	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.3 - Q 5** Form a differential equation representing the given family of curves by eliminating arbitrary constants a and b. y = ex (a cos x + b sin x) Watch Free Video Solution on Doubtnut
30	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.3 - Q 6** Form the differential equation of the family of circles touching the y-axis at origin. Watch Free Video Solution on Doubtnut
	NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.3 - Q 7

31	Form the differential equation of the family of parabolas having vertex at origin and axis along positive y-axis. Watch Free Video Solution on Doubtnut
32	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.3 - Q 8** Form the differential equation of the family of ellipses having foci on y-axis and centre at origin. Watch Free Video Solution on Doubtnut
33	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.3 - Q 9** Form the differential equation of the family of hyperbolas having foci on x-axis and centre at origin. Watch Free Video Solution on Doubtnut
34	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.3 - Q 10** Form the differential equation of the family of circles having centre on y-axis and radius 3 units. Watch Free Video Solution on Doubtnut
35	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.3 - Q 11** Which of the following differential equations has $y = c_1 e^x + c_2 e^{-x}$ as the general solution? (A) $\frac{d^2y}{dx^2} + y = 0$ (B) $\frac{d^2y}{dx^2} - y = 0$ (C) $\frac{d^2y}{dx^2} + 1 = 0$ (D) $\frac{d^2y}{dx^2} - 1 = 0$ Watch Free Video Solution on Doubtnut
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36	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.3 - Q 12** Which of the following differential equations has y = x as one of its particular solution? (A) $\frac{d^2y}{dx^2} - x^2\frac{dy}{dx} + xy = x$ (B) $\frac{d^2y}{dx^2} + x\frac{dy}{dx} + xy = x$ (C) $\frac{d^2y}{dx^2} - x^2\frac{dy}{dx} + xy = 0$ (D) `(d^2y)/(dx^2)+x(dy)/(dx)+x y=0 Watch Free Video Solution on Doubtnut
37	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 1** Find the general solution of the differential equations $\frac{dy}{dx} = \frac{1-\cos x}{1+\cos x}$ Watch Free Video Solution on Doubtnut
38	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 2** Find the general solution of the differential equations `(dy)/(dx)=sqrt(4-y^2)(-2 Watch Free Video Solution on Doubtnut
39	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 3** Find the general solution of the differential equations $\frac{dy}{dx} + y = 1(y \neq 1)$ Watch Free Video Solution on Doubtnut
	NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 4

40	Find the general solution of the differential equations $\sec^2 x \tan y dx + \sec^2 y \tan x dy = 0$ Watch Free Video Solution on Doubtnut
41	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 5** Find the general solution of the differential equations $\left(e^x + e^{-x}\right) dy - \left(e^x - e^{-x}\right) dx = 0$ Watch Free Video Solution on Doubtnut

42	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 6** Find the general solution of the differential equations $\frac{dy}{dx} = \left(1 + x^2\right)\left(1 + y^2\right)$ Watch Free Video Solution on Doubtnut
43	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 7** Find the general solution of the differential equations y log y dx – x dy = 0 Watch Free Video Solution on Doubtnut
44	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 8** Find the general solution of the differential equations $x^5 \frac{dy}{dx} = -y^5$

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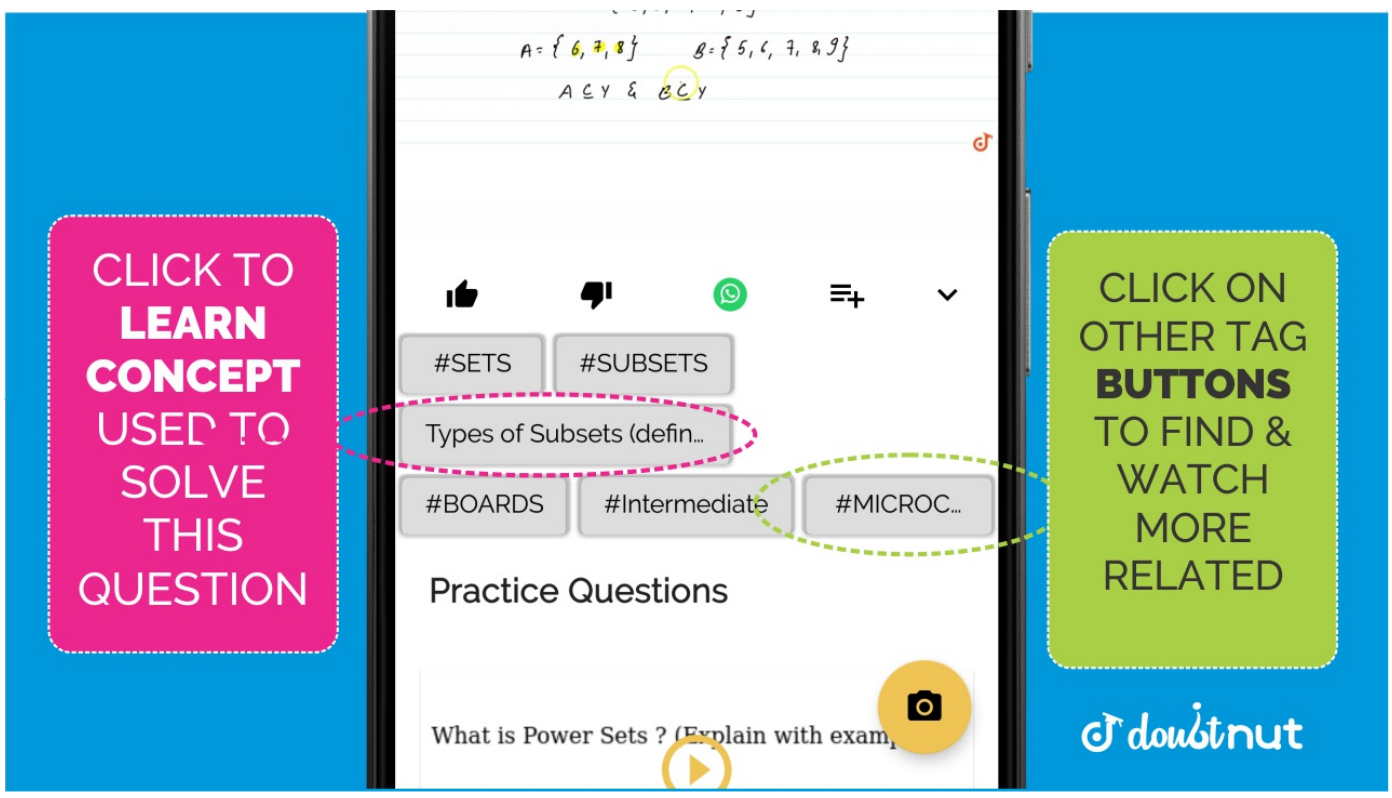
45	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 9** Find the general solution of the differential equations $\frac{dy}{dx} = \sin^{-1} x$ Watch Free Video Solution on Doubtnut
46	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 10** Find the general solution of the differential equations $e^x \tan y dx$ $+ (1 - e^x)\sec^2 y dy = 0$ Watch Free Video Solution on Doubtnut
47	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 11** The differential equations, find a particular solution satisfying the given condition: $\left(x^3 + x^2 + x + 1\right)\frac{dy}{dx}$ $= 2x^2 + x; y = 1$ when $x = 0$ Watch Free Video Solution on Doubtnut
	
48	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 12** The differential equations, find a particular solution satisfying the given condition: $x\left(x^2 - 1\right)\frac{dy}{dx} = 1; y = 0$ when $x = 2$

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49	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 13** The differential equations, find a particular solution satisfying the given condition: $\cos\left(\frac{dy}{dx}\right) = a(a \in R); y$ $= 1$ Watch Free Video Solution on Doubtnut
50	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 14** The differential equations, find a particular solution satisfying the given condition: $\frac{dy}{dx} = y\tan x; y = 1$ when x = 0 Watch Free Video Solution on Doubtnut
51	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 15** Find the equation of a curve passing through the point (0, 0) and whose differential equation is $y' = ex\sin x$ Watch Free Video Solution on Doubtnut
52	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 16** For the differential equation $xy\frac{dy}{dx} = (x+2)(y+2)$, find the solution curve passing through the point $(1, \quad 1)$. Watch Free Video Solution on Doubtnut
53	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 17** Find the equation of a curve passing through the point $(0, \quad 2)$ given that at any point (x, y) on the curve, the product of the slope of its tangent and y coordinate of the point is equal to the x coordinate of the point. Watch Free Video Solution on Doubtnut

54	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 18** At any point (x, y) of a curve, the slope of the tangent is twice the slope of the line segment joining the point of contact to the point $(\quad 4, \quad 3)$. Find the equation of the curve given that it passes through $(2, \quad 1)$. Watch Free Video Solution on Doubtnut
55	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 19** The volume of spherical balloon being inflated changes at a constant rate. If initially its radius is 3 units and after 3 seconds it is 6 units. Find the radius of balloon after t seconds. Watch Free Video Solution on Doubtnut
56	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 20** In a bank, principal increases continuously at the rate of r% per year. Find the value of r if Rs 100 double itself in 10 years $(\log e^2 = 0.6931)$ Watch Free Video Solution on Doubtnut
57	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 21** In a bank, principal increases continuously at the rate of 5% per year. An amount of Rs 1000 is deposited with this bank, how much will it worth after 10 years $(e^{0.5} = 1.648)$ Watch Free Video Solution on Doubtnut
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58	**Q 22** In a culture, the bacteria count is 1,00,000. The number is increased by 10% in 2 hours. In how many hours will the count reach 2,00,000, if the rate of growth of bacteria is proportional to the number present? Watch Free Video Solution on Doubtnut
59	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.4 - Q 23** The general solution of the differential equation $\frac{dy}{dx} = e^{x+y}$ is (A) $e^{x} + e^{-y} = C$ (B) $e^{x} + e^{y} = C$ (C) $e^{-x} + e^{y} = C$ (D) $e^{-x} + e^{-y} = C$ Watch Free Video Solution on Doubtnut

60	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 - Q 1** Show that the given differential equation is homogeneous and solve each of them. $\left(x^{2}+xy\right)dy$ $=\left(x^{2}+y^{2}\right)dx$

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61	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 - Q 2** Show that the given differential equation is homogeneous and solve each of them. $y' = \frac{x+y}{x}$ Watch Free Video Solution on Doubtnut
62	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 - Q 3** Show that the given differential equation is homogeneous and solve each of them. $(x-y)dy-(x+y)dx=0$ Watch Free Video Solution on Doubtnut
63	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 - Q 4** Show that the given differential equation is homogeneous and solve each of them. $\left(x^2-y^2\right)dx+2xydy=0$ Watch Free Video Solution on Doubtnut
64	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 - Q 5** Show that the given differential equation is homogeneous and solve each of them. $x^2\frac{dy}{dx}=x^2-2y^2+xy$ Watch Free Video Solution on Doubtnut
65	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 - Q 6** Show that the given differential equation is homogeneous and solve each of them. $xdy-ydx$ $=\sqrt{x^2+y^2}dx$ Watch Free Video Solution on Doubtnut

66	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 - Q 7** Show that the given differential equation is homogeneous and solve each of them. $\left\{x\cos\left(\frac{y}{x}\right)\right.$ $+y\sin\left(\frac{y}{x}\right)\}ydx$ $=\left\{y\sin\left(\frac{y}{x}\right)\right.$ $-\cos\left(\frac{y}{x}\right)\}xdy$ Watch Free Video Solution on Doubtnut
67	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 - Q 8** Show that the given differential equation is homogeneous and solve each of them. $x\frac{dy}{dx}-y+x\sin\left(\frac{y}{x}\right)$ $=0$ Watch Free Video Solution on Doubtnut
68	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 - Q 9** Show that the given differential equation is homogeneous and solve each of them. $ydx+x\log\left(\frac{y}{x}\right)dy$ $-2xdy=0$ Watch Free Video Solution on Doubtnut
	NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 -

69	**Q 10** Show that the given differential equation is homogeneous and solve each of them. $\left(1+e^{\frac{x}{y}}\right)dx$ $+e^{\frac{x}{y}}\left(1-\frac{x}{y}\right)dy=0$ Watch Free Video Solution on Doubtnut
70	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 - Q 11** The differential equations , find the particular solution satisfying the given condition: $(x+y)dy+(x-y)dx$ $=0; y=1$ when $x=1$ Watch Free Video Solution on Doubtnut
71	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 - Q 12** The differential equations , find the particular solution satisfying the given condition: $x^2dy+\left(xy+y^2\right)dx=0;$ y = 1 when x = 1 Watch Free Video Solution on Doubtnut
72	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 - Q 13** The differential equations , find the particular solution satisfying the given condition: $\left[x\sin^2\left(\frac{y}{x}\right)-y\right]dx$ $+xdy=0; y=\frac{\pi}{4}$ when x = 1

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73	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 - Q 14** The differential equations , find the particular solution satisfying the given condition: $\frac{dy}{dx} - \frac{y}{x} + \cos ec\left(\frac{y}{x}\right) = 0; y = 0$ when x = 1 Watch Free Video Solution on Doubtnut
74	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 - Q 15** The differential equations , find the particular solution satisfying the given condition: $2xy + y^2 - 2x^2\frac{dy}{dx} = 0; y = 2$ when x = 1 Watch Free Video Solution on Doubtnut
75	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 - Q 16** A homogeneous differential equation of the from $\frac{dx}{dy} = h\left(\frac{x}{y}\right)$ can be solved by making the substitution. (A) $y = vx$ (B) $v = yx$ (C) $x = vy$ (D) $x = v$ Watch Free Video Solution on Doubtnut
76	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.5 - Q 17** Which of the following is a homogeneous differential equation? (A) $(4x + 6y + 5)\ dy\ (3y + 2x + 4)\ dx = 0$ (B) $(xy)dx - \left(x^3 + y^3\right)dy = 0$ (C) $\left(x^3 + 2y^2\right)dx + 2xydy = 0$ (D) $y^2dx + \left(x^2 - xy - y^2\right)dy = 0$

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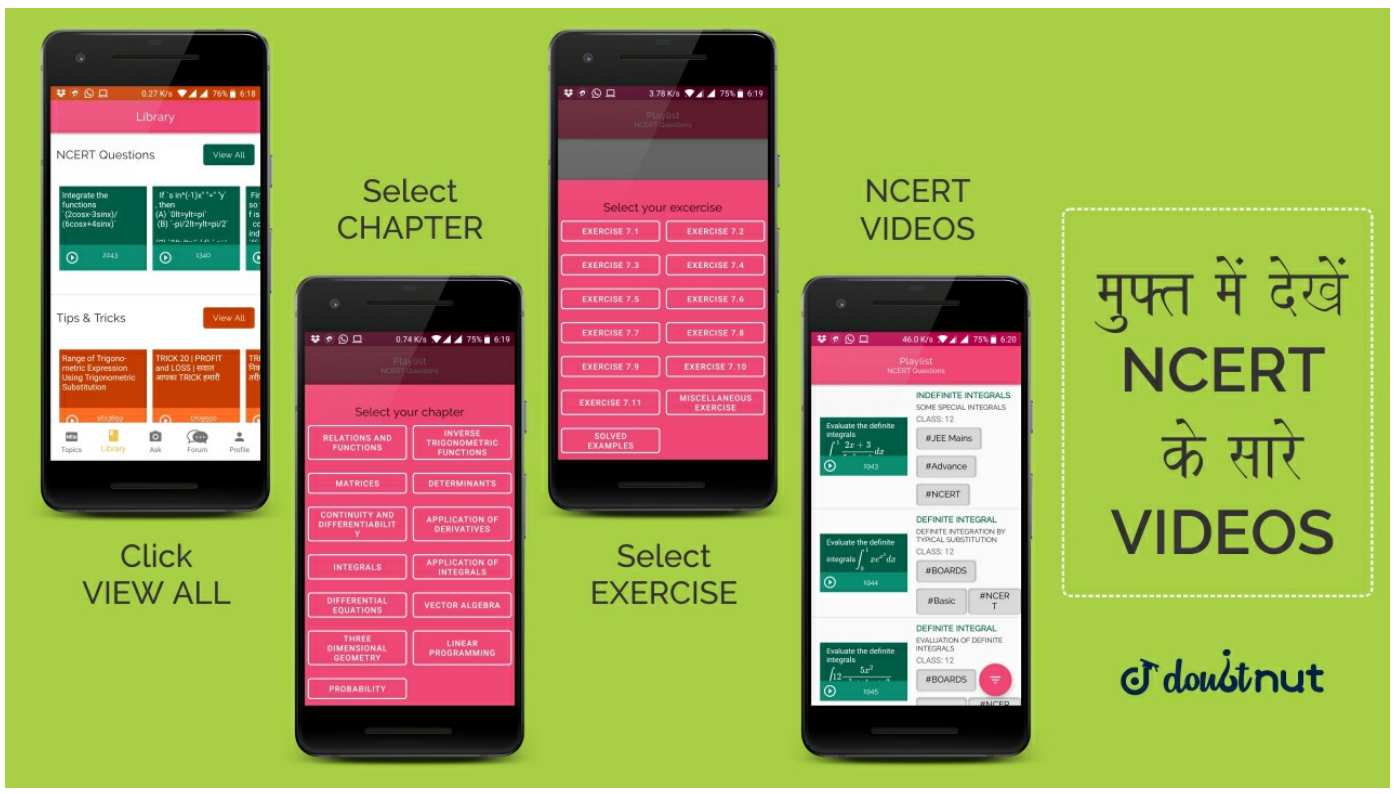
77	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 1** Find the general solution of the differential equations: $\frac{dx}{dy}+2y=\sin x$ Watch Free Video Solution on Doubtnut
	
78	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 2** Find the general solution of the differential equations: $\frac{dx}{dy}+3y=e^{-2x}$ Watch Free Video Solution on Doubtnut
79	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 3** Find the general solution of the differential equations: $\frac{dx}{dy}+\frac{y}{x}=x^2$ Watch Free Video Solution on Doubtnut
80	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 4** Find the general solution of the differential equations: `(dx)/(dy)+secx y=tanx(0lt=x Watch Free Video Solution on Doubtnut
81	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 5** Find the general solution of the differential equations: `cos^2x(dx)/(dy)+y=tanx(0lt=x

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82	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 6** Find the general solution of the differential equations: $x\frac{dx}{dy}+2y=x^2\log x$ Watch Free Video Solution on Doubtnut
83	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 7** Find the general solution of the differential equations: $x\log x\frac{dx}{dy}+y=\frac{2}{x}\log x$ Watch Free Video Solution on Doubtnut

84	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 8** Find the general solution of the differential equations: $\left(1+x^2\right)dy+2xydx$ $=\cot xdx(x\neq 0)$

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85	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 9** Find the general solution of the differential equations: $x\frac{dx}{dy}+y-x+xy\cot x$ $=0(x\neq 0)$ Watch Free Video Solution on Doubtnut
86	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 10** Find the general solution of the differential equations: $(x+y)\frac{dx}{dy}=1$ Watch Free Video Solution on Doubtnut
87	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 11** $ydx+\left(x-y^2\right)dy=0$ Watch Free Video Solution on Doubtnut
88	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 12** Find the general solution of the differential equations: $\left(x+3y^2\right)\frac{dx}{dy}=y(y>0)$ Watch Free Video Solution on Doubtnut
89	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 13** The differential equations, find a particular solution satisfying the given condition: $\frac{dx}{dy}+2y\tan x=\sin x;y$ $=0$ when $x=\frac{\pi}{3}$ Watch Free Video Solution on Doubtnut

90	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 14** The differential equations, find a particular solution satisfying the given condition: $\left(1+x^2\right)\frac{dy}{dx}+2xy$ $=\frac{1}{1+x^2};y=0$ when $x \quad = \quad 1$ Watch Free Video Solution on Doubtnut
91	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 15** The differential equations, find a particular solution satisfying the given condition: $\frac{dy}{dx}-3y\cot x=\sin 2x;y$ $=2$ when $x=\frac{\pi}{2}$ Watch Free Video Solution on Doubtnut
92	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 16** Find the equation of a curve passing through the origin given that the slope of the tangent to the curve at any point (x, y) is equal to the sum of the coordinates of the point. Watch Free Video Solution on Doubtnut
93	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 17** Find the equation of a curve passing through the point (0, 2) given that the sum of the coordinates of any point on the curve exceeds the magnitude of the slope of the tangent to the curve at that point by 5.

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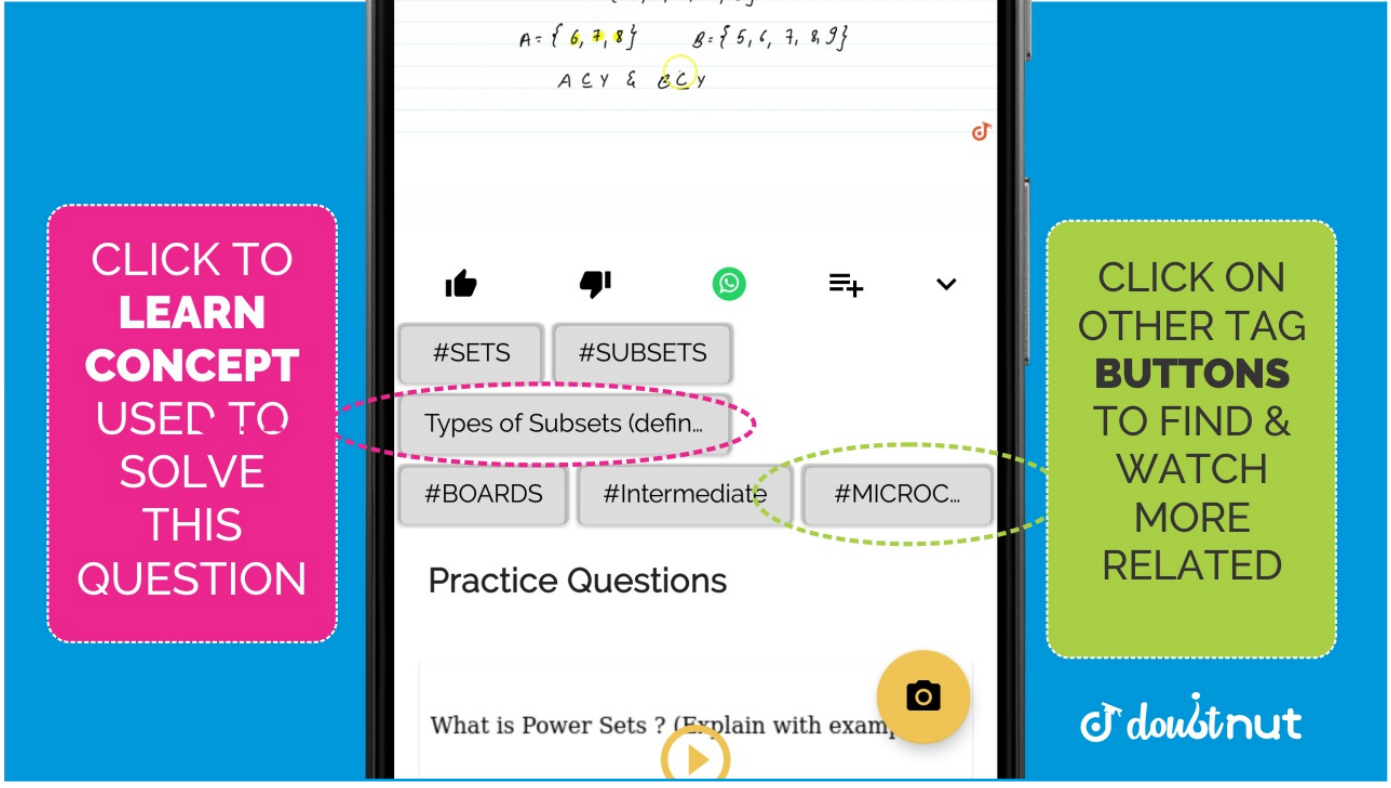
94	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - EXERCISE 9.6 - Q 18** The Integrating Factor of the differential equation $x\frac{dy}{dx} - y = 2x^2$ is (A) e^{-x} (B) e^{-y} (C) $\frac{1}{x}$ (D) x Watch Free Video Solution on Doubtnut
95	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - Q 19** The Integrating Factor of the differential equation `(1-y^2)(dx)/(dy)+y x=a y(-1 Watch Free Video Solution on Doubtnut
	
96	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 1** For each of the differential equations given below, indicate its order and degree (if defined). (i) $\frac{d^2y}{dx^2} + 5x\left(\frac{dy}{dx}\right)^2 - 6xy = \log x$ (ii) $\left(\frac{dy}{dx}\right)^3 - 4\left(\frac{dy}{dx}\right)^2 + 7y = \sin x$ (iii) $\frac{d^4y}{dx^4} - \sin\left(\frac{d^3y}{dx^3}\right) = 0$ Watch Free Video Solution on Doubtnut
	NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 2

97	For each of the exercises given below, verify that the given function (implicit or explicit) is a solution of the corresponding differential equation. (i) $y = ae^{x} + be^{-x} + x^{2}$: $x\frac{d^{2}y}{dx^{2}} + 2y\frac{dy}{dx} - xy + x^{2} - 2 = 0$ (ii) `y=e^x(acosx+bsin Watch Free Video Solution on Doubtnut
98	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 3** Form the differential equation representing the family of curves given by $(x-a)^{2} + 2y^{2} = a^{2}$, where a is an arbitrary constant. Watch Free Video Solution on Doubtnut
99	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 4** Prove that $x^{2} - y^{2} = c\left(x^{2} + y^{2}\right)^{2}$ is the general solution of differential equation $\left(x^{3} - 2xy^{2}\right)dx = \left(y^{3} - 3x^{2}y\right)dy$, where c is a parameter. Watch Free Video Solution on Doubtnut
100	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 5** Form the differential equation of the family of circles in the first quadrant which touch the coordinate axes. Watch Free Video Solution on Doubtnut
101	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 6** Find the general solution of the differential equation $\frac{dy}{dx} + \sqrt{\frac{1-y^{2}}{1-x^{2}}} = 0$. Watch Free Video Solution on Doubtnut



102	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 7** Show that the general solution of the differential equation $\frac{dy}{dx} + \frac{y^2 + y + 1}{x^2 + x + 1} = 0$ is given by $(x + y + 1) = A(1 - x - y - 2xy)$ where A is a parameter Watch Free Video Solution on Doubtnut
103	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 8** Find the equation of the curve passing through the point $\left(0, \frac{\pi}{4}\right)$ whose differential equation is $\sin x \quad \cos y \quad dx + \cos x \quad \sin y \quad dy = 0$. Watch Free Video Solution on Doubtnut
104	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 9** Find the particular solution of the differential equation $\left(1 + e^{2x}\right) dy + \left(1 + y^2\right) e^x dx = 0$, given that $y = 1 \quad when \quad x = 0$. Watch Free Video Solution on Doubtnut

105	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 10** Solve the differential equation $ye^{\frac{x}{y}}dx = \left(xe^{\frac{x}{y}} + y^2\right)dy(y \neq 0)$ Watch Free Video Solution on Doubtnut
106	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 11** Find a particular solution of the differential equation $(x - y)(dx + dy) = dx$ dy , given that $y = 1$, when $x = 0$. (Hint: put $x - y = t$). Watch Free Video Solution on Doubtnut
107	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 12** Solve the differential equation $\left[\frac{e^{-2\sqrt{x}}}{\sqrt{x}} - \frac{y}{\sqrt{x}}\right]\frac{dx}{dy}$ $= 1(x \neq 0)$ Watch Free Video Solution on Doubtnut

	NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS -

108	**MISCELLANEOUS EXERCISE - Q 13** Find a particular solution of the differential equation $\frac{dx}{dy} + y\cot x$ $= 1(x \neq 0)4x\cos ecx$ $(x \neq 0)$, given that $y = 0$ when $x = \frac{\pi}{2}$ Watch Free Video Solution on Doubtnut
109	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 14** Find a particular solution of the differential equation $(x+1)\frac{dy}{dx} = 2e^{-y} - 1$ given that $y = 0$ when$x = 0$. Watch Free Video Solution on Doubtnut
110	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 15** The population of a village increases continuously at the rate proportional to the number of its inhabitants present at any time. If the population of the village was 20, 000 in 1999 and 25000 in the year 2004, what will be the population of the village in 2009? Watch Free Video Solution on Doubtnut
111	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 16** The general solution of the differential equation $\frac{ydx - xdy}{y} = 0$ is (A) $xy = C$ (B) $x = Cy^2$ (C) $y = Cx$ (D) $y = Cx^2$ Watch Free Video Solution on Doubtnut
112	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 17** The general solution of a differential equation of the type $\frac{dx}{dy} + P_1 x = Q_1$ is (A) $ye^{\int P_1 dy} = \int\left(Q_1 e^{\int P_1 dy}\right)dy + C$ (B) $ye^{\int P_1 dx} = \int\left(Q_1 e^{\int P_1 dx}\right)dx + C$ (C)

$xe^{\int P_1 dy} =$

$\int\left(Q_1 e^{\int P_1 dy}\right) dy + C$

(D)

$xe^{\int p_1 dx} = \int Q_1 e^{\int p_1 dx} dx$

$+ C$

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113	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - MISCELLANEOUS EXERCISE - Q 18** The general solution of the differential equation $e^x \quad dy \quad + \quad (y \quad e^x \quad + \quad 2x) \quad dx \quad = \quad 0$ is (A) $xe^y + x^2 = C$ (B) $xe^y + y^2 = C$ (C) $ye^x + x^2 = C$ (D) $ye^y + x^2 = C$ Watch Free Video Solution on Doubtnut

114	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 1** Find the order and degree, if defined, of each of the following differential equations: (i) $\frac{dy}{dx} - \cos x = 0$ (ii) $xy\frac{d^2y}{dx^2} + x\left(\frac{dy}{dx}\right)^2 - y\frac{dy}{dx} = 0$ (iii) $y^m + y^2 + e^{y'} = 0$ Watch Free Video Solution on Doubtnut
	NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 2

115	Verify that the function $y = e^{-3x}$ is a solution of the differential equation $\frac{d^2y}{dx^2} + \frac{dy}{dx} - 6y = 0$ Watch Free Video Solution on Doubtnut
116	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 3** Verify that the function $y = a \cos x + b \sin x$, where, a, $b \in R$ is a solution of the differential equation $\frac{d^2y}{dx^2} + y = 0$. Watch Free Video Solution on Doubtnut
117	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 4** Form the differential equation representing the family of curves $y = mx$, where, m is arbitrary constant. Watch Free Video Solution on Doubtnut
118	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 5** Form the differential equation representing the family of curves $y = a s \in (x + b)$, where a, b are arbitrary constants. Watch Free Video Solution on Doubtnut
119	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 6** Form the differential equation representing the family of ellipses having foci on x-axis and centre at the origin. Watch Free Video Solution on Doubtnut
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120	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 7** Form the differential equation of the family of circles touching the x-axis at origin. Watch Free Video Solution on Doubtnut
121	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 8** Form the differential equation representing the family of parabolas having vertex at origin and axis along positive direction of x-axis. Watch Free Video Solution on Doubtnut
122	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 9** Find the general solution of the differential equation $\frac{dy}{dx} = \frac{x+1}{2-y}, (y \neq 2)$ Watch Free Video Solution on Doubtnut
123	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 10** Find the general solution of the differential equation $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$. Watch Free Video Solution on Doubtnut
124	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 11** Find the particular solution of the differential equation $\frac{dy}{dx} = -4xy^2$ given that $y = 1$, when $x = 0$.

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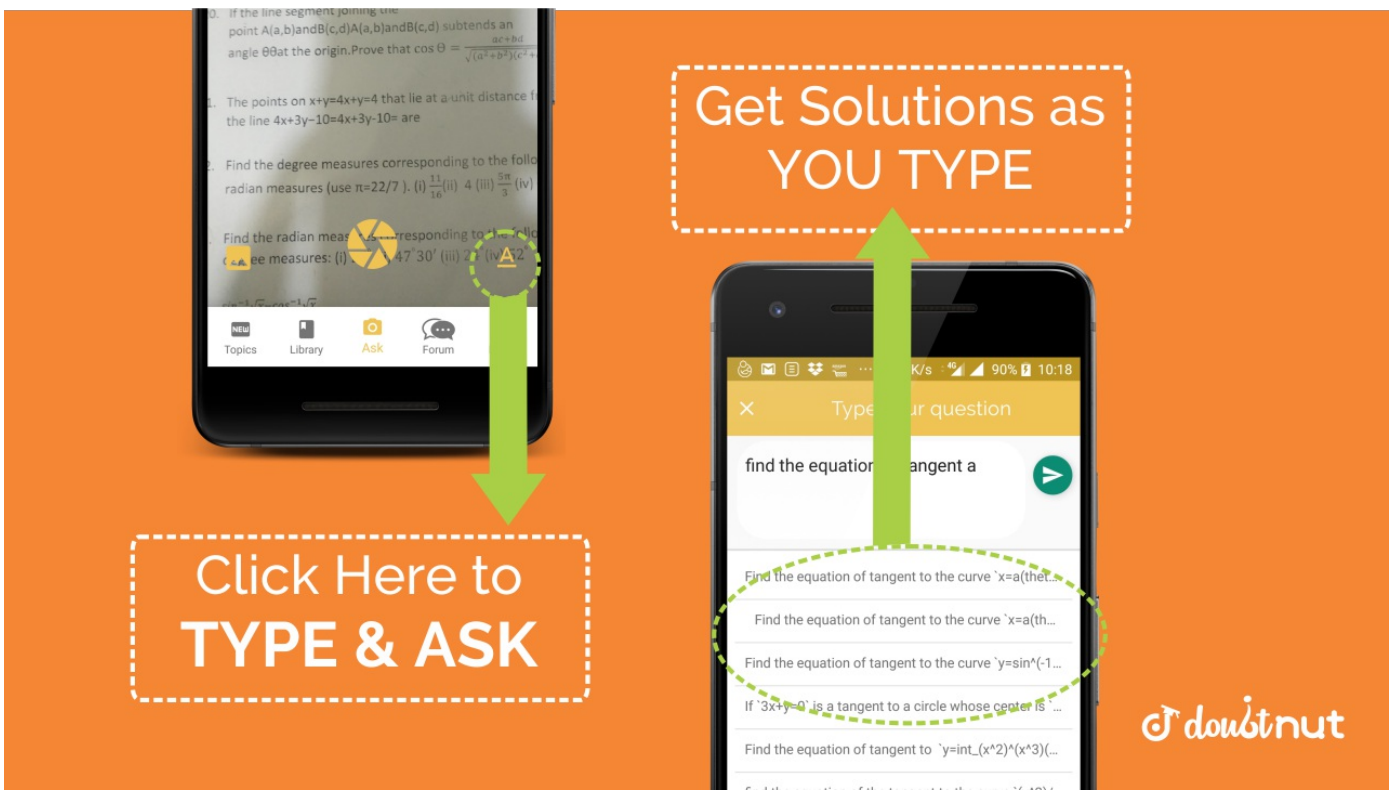
125	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 12** Find the equation of the curve passing through the point (1, 1) whose differential equation is $x \quad dy$ $= \left(2x^2 + 1\right) dx (x \neq 0)$. Watch Free Video Solution on Doubtnut
	
126	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 13** Find the equation of a curve passing through the point $(2, \quad 3)$, given that the slope of the tangent to the curve at any point (x, y) is $\frac{2x}{y^2}$. Watch Free Video Solution on Doubtnut
127	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 14** In a bank, principal increases continuously at the rate of 5% per year. In how many years Rs 1000 double itself? Watch Free Video Solution on Doubtnut
128	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 15** Show that the differential equation $(x - y)\frac{dy}{dx} = x + 2y$ is homogeneous and solve it.

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129	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 16** Show that the differential equation $x\cos\left(\frac{y}{x}\right)\frac{dy}{dx}$ $=y\cos\left(\frac{y}{x}\right)+x$ is homogeneous and solve it. Watch Free Video Solution on Doubtnut
130	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 17** Show that the differential equation $2ye^{\frac{x}{y}}dx+\left(y-2xe^{\frac{x}{y}}\right)dy$ $=0$ is homogeneous and find its particular solution, given that, $x=0$ when $y=1$. Watch Free Video Solution on Doubtnut
131	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 18** Show that the family of curves for which the slope of the tangent at any point (x, y) on it is $\frac{x^2+y^2}{2xy}$, is given by $x^2-y^2=cx$. Watch Free Video Solution on Doubtnut

NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 19

132	Find the general solution of the differential equation $\frac{dy}{dx} - y = \cos x$ Watch Free Video Solution on Doubtnut
133	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 20** Find the general solution of the differential equation $x\frac{dy}{dx} + 2y = x^2(x \neq 0)$. Watch Free Video Solution on Doubtnut
134	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 21** Find the general solution of the differential equation $ydx - \left(x + 2y^2\right)dy = 0$. Watch Free Video Solution on Doubtnut
135	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 22** Find the particular solution of the differential equation $\frac{dy}{dx} + y\cot x = 2x$ $+ x^2\cot x(x \neq 0)$ given that $y = 0$ when $x = \frac{\pi}{2}$. Watch Free Video Solution on Doubtnut
136	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 23** Find the equation of a curve passing through the point (0, 1). If the slope of the tangent to the curve at any point (x, y) is equal to the sum of the x coordinate (abscissa) and the product of the x coordinate and y coordinate (ordinate) of that point. Watch Free Video Solution on Doubtnut
137	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 24** Verify that the function $y = c_1e^{ax}\cos bx$ $+ c_2e^{ax}\sin bx$, where c_1, c_2 are arbitrary constants is a solution of the differential equation. $\frac{d^2y}{dx^2} - 2a\frac{dy}{dx}$ $+ \left(a^2 + b^2\right)y = 0$

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138	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 25** Form the differential equation of the family of circles in the second quadrant and touching the coordinate axes. Watch Free Video Solution on Doubtnut
139	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 26** Find the particular solution of the differential equation $\frac{\log(dy)}{dx} = 3x + 4y$ given that $y = 0$ when $x = 0$. Watch Free Video Solution on Doubtnut
140	**NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 27** Solve the differential equation $(xdy - ydx)y\sin\left(\frac{y}{x}\right)$ $= (ydx + xdy)x\cos\left(\frac{y}{x}\right)$. Watch Free Video Solution on Doubtnut
	NCERT - CLASS 12 - CHAPTER 9 DIFFERENTIAL EQUATIONS - SOLVED EXAMPLES - Q 28

141

Solve the differential equation
$\left(\tan^{-1} y - x\right) dy = \left(1 + y^2\right) dx$
.

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