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India's Number 1 Education App

## MATHS

## NCERT - NCERT MATHEMATICS(HINGLISH)

## DIFFERENTIAL EQUATIONS

Exercise 92

1. The number of arbitrary constants in the particular solution of a differential equationof third order are:(A) 3
(B) 2
(C) 1
(D) 0
2. The number of arbitrary constants in the general solution of a differential equationof fourth order are:(A) 0
(B) 2
(C) 3
(D) 4

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3. Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation:
$y=\sqrt{a^{2}-x^{2}} x \in(-x, a): x+y \frac{d y}{d x}=0(y \neq 0)$

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4. Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation:

$$
y=\sqrt{1+x^{2}}: y^{\prime}=\frac{x y}{1+x^{2}}
$$

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5. Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation:

$$
y=\sqrt{1+x^{2}}: y^{\prime}=\frac{x y}{1+x^{2}} y=A x: x y^{\prime}=y(x \neq 0)
$$

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6. Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation:

$$
\begin{aligned}
& y=x \sin x \quad: \quad x y^{\prime}=y+x \sqrt{x^{2}-y^{2}}(x \neq 0 \text { and } \\
& x>y \text { or } x<y)
\end{aligned}
$$

7. Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation: $x y=\log y+C: y^{\prime}=\frac{y^{2}}{1-x y}(x y \neq 1)$

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8. Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation:

$$
y=e^{x}+1: y^{\prime \prime}-y^{\prime}=0
$$

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9. Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation:
$y=x^{2}+2 x+C: y^{\prime}-2 x-2=0$

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10. Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation:
$y=\cos x+C: y^{\prime}+\sin x=0$

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11. Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation:

$$
y-\cos y=x:(y \sin y+\cos y+x) y^{\wedge}=y
$$

12. Verify that the given functions (explicit or implicit) is a solution of the corresponding differential equation: $x+y=\tan ^{-1} y: y^{2} y^{\prime}+y^{2}+1=0$

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## Miscellaneous Exercise

> 1. Solve the $\quad$ differential equation
> $y e^{\frac{x}{y}} d x=\left(x e^{\frac{x}{y}}+y^{2}\right) d y(y \neq 0)$

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2. Find a particular solution of the differential equation $(x-y)(d x+d y)=d x d y$, given that $y=1$, when $x=0$.
(Hint: put $x-y=t$.

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$$
\begin{aligned}
& \text { 3. Solve the } \\
& {\left[\frac{e^{-2 \sqrt{x}}}{\sqrt{x}}-\frac{y}{\sqrt{x}}\right] \frac{d x}{d y}=1(x \neq 0)}
\end{aligned}
$$

## D Watch Video Solution

4. Find a particular solution of the differential equation $(x+1) \frac{d y}{d x}=2 e^{-y}-1$ given that $y=0$ when $x=0$.
5. 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 ?

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6. The general solution of the differential equation

$$
\begin{align*}
& \frac{y d x-x d y}{y}=0 \operatorname{is}(\mathrm{~A}) x y=C \text { (В) } x=C y^{2} \text { (С) } y=C x \\
& y=C x^{2} \tag{D}
\end{align*}
$$

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7. The general solution of a differential equation of the type $\frac{d x}{d y}+P_{1} x=Q_{1}$ is(A) $y e^{\int P_{1} d y}=\int\left(Q_{1} e^{\int P_{1} d y}\right) d y+C$
(B)

$$
\begin{equation*}
y e^{\int P_{1} d x}=\int\left(Q_{1} e^{\int P_{1} d x}\right) d x+C(\mathrm{C}) \tag{D}
\end{equation*}
$$

$x e^{\int P_{1} d y}=\int\left(Q_{1} e^{\int P_{1} d y}\right) d y+C$
$x e^{\int p_{1} d x}=\int Q_{1} e^{\int p_{1} d x} d x+C$

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8. The general solution of the differential equation
$e^{x} d y+\left(y e^{x}+2 x\right) d x=0 \mathrm{is}(\mathrm{A}) \quad x e^{y}+x^{2}=C$
$x e^{y}+y^{2}=C$ (C) $y e^{x}+x^{2}=C$ (D) $y e^{y}+x^{2}=C$

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9. Find a particular solution of the differential equation $\frac{d x}{d y}+y \cot x=1(x \neq 0) 4 x \cos e c x(x \neq 0)$, given that $y=0$ when $x=\frac{\pi}{2}$

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10. Prove that $x^{2}-y^{2}=c\left(x^{2}+y^{2}\right)^{2}$ is the general solution of differential equation
$\left(x^{3}-3 x y^{2}\right) d x=\left(y^{3}-3 x^{2} y\right) d y$, where c is a parameter.

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11. Find the equation of the curve passing through the point $\quad\left(0, \frac{\pi}{4}\right)$ whose differential equation is
$\sin x \cos y d x+\cos x \sin y d y=0$.

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12. Show that the general solution of the differential equation $\frac{d y}{d x}+\frac{y^{2}+y+1}{x^{2}+x+1}=0 \quad$ is given by $(x+y+1)=A(1-x-y-2 x y) \quad$ where $\quad \mathrm{A}$ is a parameter

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13. Find the general solution of the differential equation $\frac{d y}{d x}+\sqrt{\frac{1-y^{2}}{1-x^{2}}}=0$.
14. Form the differential equation of the family of circles in the first quadrant which touch the coordinate axes.

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15. Form the differential equation representing the family of curves given by $(x-a)^{2}+2 y^{2}=a^{2}$, where a is an arbitrary constant.

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16. Verify that the given function (implicit or explicit) is a solution of the corresponding differential equation.(i)
$y=a e^{x}+b e^{-x}+x^{2}$
$x \frac{d^{2} y}{d x^{2}}+2 y \frac{d y}{d x}-x y+x^{2}-2=0$

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17. For each of the differential equations given below, indicate its order and degree (if defined).(i)
$\frac{d^{2} y}{d x^{2}}+5 x\left(\frac{d y}{d x}\right)^{2}-6 x y=\log x$
$\left(\frac{d y}{d x}\right)^{3}-4\left(\frac{d y}{d x}\right)^{2}+7 y=\sin x(\mathrm{iii})$
$\frac{d^{4} y}{d x^{4}}-\sin \left(\frac{d^{3} y}{d x^{3}}\right)=0$

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18. Find the particular solution of the differential equation
$\left(1+e^{2 x}\right) d y+\left(1+y^{2}\right) e^{x} d x=0, \quad$ given $\quad$ that $y=1 w h e n x=0$.

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## Exercise 96

1. Find the general solution of the differential equations: ${ }^{\prime}(d x) /(d y)+\sec x y=\tan x($ Olt $=x$

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2. Find the general solution of the differential equations:
$\cos ^{2} x\left(\frac{d y}{d x}\right)+y=\tan x,\left(0 \leq x \leq \frac{\pi}{2}\right)$

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3. Find the general solution of the differential equations:
$x \frac{d x}{d y}+2 y=x^{2} \log x$

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4. 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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5. 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.

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6. The differential equations, find a particular solution satisfying $\quad$ the $\quad$ given
$\frac{d y}{d x}-3 y \cot x=\sin 2 x ; y=2$ when $x=\frac{\pi}{2}$
7. The differential equations, find a particular solution satisfying the given condition: $\left(1+x^{2}\right) \frac{d y}{d x}+2 x y=\frac{1}{1+x^{2}} ; y=0$ when $x=1$

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8. The differential equations, find a particular solution satisfying the given condition:
$\frac{d x}{d y}+2 y \tan x=\sin x ; y=0$ when $x=\frac{\pi}{3}$

## D Watch Video Solution

9. Find the general solution of the differential equations:
$\left(x+3 y^{2}\right) \frac{d x}{d y}=y(y>0)$
10. $y d x+\left(x-y^{2}\right) d y=0$

## ( Watch Video Solution

11. Find the general solution of the differential equations:
$(x+y) \frac{d x}{d y}=1$

## D Watch Video Solution

12. Find the general solution of the differential equations:
$x \log x \frac{d x}{d y}+y=\frac{2}{x} \log x$
13. The Integrating Factor of the differential equation $\left(1-y^{2}\right) \frac{d x}{d y}+y x=a y,(-1<y<1)$ is
(A) $\frac{1}{y^{2}-1}$
(B) $\frac{1}{\sqrt{y^{2}-1}}$
(C) $\frac{1}{1-y^{2}}$
(D) $\frac{1}{\sqrt{1-y^{2}}}$

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14. The Integrating Factor of the differential equation $x \frac{d y}{d x}-y=2 x^{2}$ is(A) $e^{-x}$ (B) $e^{-y}$ (C) $\frac{1}{x}$ (D) x

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15. Find the general solution of the differential equations:
$\left(1+x^{2}\right) d y+2 x y d x=\cot x d x(x \neq 0)$
16. Find the general solution of the differential equations:
$x \frac{d x}{d y}+y-x+x y \cot x=0(x \neq 0)$

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17. Find the general solution of the differential equations: $\frac{d x}{d y}+2 y=\sin x$

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18. Find the general solution of the differential equations:
$\frac{d x}{d y}+3 y=e^{-2 x}$
19. Find the general solution of the differential equations:
$\frac{d x}{d y}+\frac{y}{x}=x^{2}$

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## Exercise 94

1. Find the general solution of the differential equations $x^{5} \frac{d y}{d x}=-y^{5}$
2. Find the general solution of the differential equations $\frac{d y}{d x}=\sin ^{-1} x$

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3. Find the general solution of the differential equations $\frac{d y}{d x}=\left(1+x^{2}\right)\left(1+y^{2}\right)$

## D Watch Video Solution

4. Find the general solution of the differential equations $y$ $\log y d x-x d y=0$
5. Find the general solution of the differential equations $\sec ^{2} x \tan y d x+\sec ^{2} y \tan x d y=0$

## D Watch Video Solution

6. Find the general solution of the differential equations

$$
\left(e^{x}+e^{-x}\right) d y-\left(e^{x}-e^{-x}\right) d x=0
$$

## ( Watch Video Solution

7. Find the general solution of the differential equations $\frac{d y}{d x}=\sqrt{4-y^{2}}, \curlywedge(-2$
8. Find the general solution of the differential equations $\frac{d y}{d x}+y=1(y \neq 1)$

## - Watch Video Solution

9. Find the general solution of the differential equations
$\frac{d y}{d x}=\frac{1-\cos x}{1+\cos x}$

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10. 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 $\left(\log _{e}^{2}=0.6931\right)$
11. In a bank, principal increases continuously at the rate of

5\% per year. An amountof Rs 1000 is deposited with this bank, how much will it worth after 10 years $\left(e^{0.5}=1.648\right)$

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12. The general solution of the differential equation $\frac{d y}{d x}=e^{x+y}$ is(A) $\quad e^{x}+e^{-y}=C \quad$ (B) $\quad e^{x}+e^{y}=C(\mathrm{C})$ $e^{-x}+e^{y}=C(\mathrm{D}) e^{-x}+e^{-y}=C$
13. 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?

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14. 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.
15. 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 $(-4,-3)$. Find the equation of the curve given that it passes through ( $-2,1$ ).

## D Watch Video Solution

16. Find the equation of a curve passing through the point
$(0,0)$ and whose differentialequation is $y^{\prime}=\left(e^{x}\right) \sin x$

## ( Watch Video Solution

17. The differential equations, find a particular solution satisfying the given condition: $\frac{d y}{d x}=y \tan x ; y=1$ when x
$=0$

## - Watch Video Solution

18. Find the equation of a curve passing through the point $(0,2)$ 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.

## D Watch Video Solution

19. For the differential equation $x y \frac{d y}{d x}=(x+2)(y+2)$, find the solution curve passing through the point $(1,-1)$.
20. The differential equations, find a particular solution satisfying the given condition:
$\left(x^{3}+x^{2}+x+1\right) \frac{d y}{d x}=2 x^{2}+x ; y=1$ when $x=0$

## - Watch Video Solution

21. Find the general solution of the differential equations
$e^{x} \tan y d x+\left(1-e^{x}\right) \sec ^{2} y d y=0$

## - Watch Video Solution

22. The differential equations, find a particular solution satisfying the given condition:
$\cos \left(\frac{d y}{d x}\right)=a(a \in R) ; y=1$

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23. The differential equations, find a particular solution satisfying the given condition: $x\left(x^{2}-1\right) \frac{d y}{d x}=1 ; y=0$ when $x=2$

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## Solved Examples

1. Show that the differential equation
$(x-y) \frac{d y}{d x}=x+2 y$ is homogeneous and solve it
2. In a bank, principal increases continuously at the rate of $5 \%$ per year. In how many years Rs 1000 double itself?

## Watch Video Solution

3. Show that the differential equation $2 y e^{\frac{x}{y}} d x+\left(y-2 x e^{\frac{x}{y}}\right) d y=0$ is homogeneous and find its particular solution, given that, $x=0$ when $y=1$.

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4. Show that the differential equation
$x \cos \left(\frac{y}{x}\right) \frac{d y}{d x}=y \cos \left(\frac{y}{x}\right)+x$ is homogeneous and solve it.
5. Find the equation of a curve passing through the point $(2,3)$, given that the slope of the tangent to the curve at any point ( $\mathrm{x}, \mathrm{y}$ ) is $\frac{2 x}{y^{2}}$.

## - Watch Video Solution

6. Find the equation of the curve passing through the point (1, 1) whose differential equation is $x d y=\left(2 x^{2}+1\right) d x(x \neq 0)$.
7. Find the general solution of the differential equation $\frac{d y}{d x}-y=\cos x$

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8. Show that the family of curves for which the slope of the tangent at any point ( $\mathrm{x}, \mathrm{y}$ ) on it is $\frac{x^{2}+y^{2}}{2 x y}$, is given by $x^{2}-y^{2}=c x$.

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9. Form the differential equation representing the family of ellipses having foci on $x$-axis and centre at the origin.
10. Form the differential equation of the family of circles touching the $x$-axis at origin.

## - Watch Video Solution

11. Form the differential equation representing the family of curves $y=m x$, where, m is arbitrary constant.

## - Watch Video Solution

12. Form the differential equation representing the family
of curves $y=a s \in(x+b)$, where $\mathrm{a}, \mathrm{b}$ are arbitrary constants.

## - Watch Video Solution

13. Verify that the function $y=e^{-3 x}$ is a solution of the differential equation $\frac{d^{2} y}{d x^{2}}+\frac{d y}{d x}-6 y=0$

## - Watch Video Solution

14. Verify that the function $y=a \cos x+b \sin x$, where, a, $b \in R$ is a solution of the differential equation $\frac{d^{2} y}{d x^{2}}+y=0$.

## - Watch Video Solution

15. Find the order and degree, if defined, of each of the following differential equations:(i) $\frac{d y}{d x}-\cos x=0$
$x y \frac{d^{2} y}{d x^{2}}+x\left(\frac{d y}{d x}\right)^{2}-y \frac{d y}{d x}=0$ (iii) $y^{\prime \prime \prime}+y^{2}+e^{y^{\prime}}=0$

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16. Form the differential equation representing the family of parabolas having vertex at origin and axis along positive direction of $x$-axis.

## - Watch Video Solution

17. Find the general solution of the differential equation $\frac{d y}{d x}=\frac{x+1}{2-y},(y \neq 2)$

## ( Watch Video Solution

> 18. Solve the differential equation $\left(\tan ^{-1} y-x\right) d y=\left(1+y^{2}\right) d x$

## D Watch Video Solution

19. Verify that the function $y=c_{1} e^{a x} \cos b x+c_{2} e^{a x} \sin b x$, where $c_{1}, c_{2}$ are arbitrary constants is a solution of the differential equation. $\frac{d^{2} y}{d x^{2}}-2 a \frac{d y}{d x}+\left(a^{2}+b^{2}\right) y=0$

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20. Form the differential equation of the family of circles in the second quadrant and touching the coordinate axes.

## - Watch Video Solution

21. Find the particular solution of the differential equation $\log \left(\frac{d y}{d x}\right)=3 x+4 y$ given that $y=0$ when $x=0$.

## - Watch Video Solution

22. Solve the differential equation
$(x d y-y d x) y \sin \left(\frac{y}{x}\right)=(y d x+x d y) x \cos \left(\frac{y}{x}\right)$.
23. Find the general solution of the differential equation $x \frac{d y}{d x}+2 y=x^{2}(x \neq 0)$.

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24. Find the general solution of the differential equation $y d x-\left(x+2 y^{2}\right) d y=0$.

## - Watch Video Solution

25. Find the particular solution of the differential equation $\frac{d y}{d x}+y \cot x=2 x+x^{2} \cot x(x \neq 0)$ given that $y=0$ when $x=\frac{\pi}{2}$.
26. 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.

## D Watch Video Solution

27. Find the particular solution of the differential equation $\frac{d y}{d x}=-4 x y^{2}$ given that $y=1$, when $x=0$.
28. Find the general solution of the differential equation $\frac{d y}{d x}=\frac{1+y^{2}}{1+x^{2}}$.

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## Exercise 93

1. Form a differential equation representing the given family of curves by eliminating arbitrary constants $a$ and $b$.
$y=a e^{3 x}+b e^{-2 x}$
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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3. 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 Video Solution

4. Form the differential equation of the family of parabolas having vertex at origin and axis along positive $y$-axis.
5. Form the differential equation of the family of circles touching the $y$-axis at origin.

## - Watch Video Solution

6. Form a differential equation representing the given family of curves by eliminating arbitrary constants $a$ and $b$.
$y=e^{x}(a \cos x+b \sin x)$

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7. Form a differential equation representing the given family of curves by eliminating arbitrary constants $a$ and $b$.
$y=e^{2 x}(a+b x)$

## - Watch Video Solution

8. Form the differential equation of the family of hyperbola having foci on $x$-axis and center at the origin.

## ( Watch Video Solution

9. Form the differential equation of the family of ellipses having foci on $y$-axis and centre at origin.
10. Form the differential equation of the family of circles having centre on $y$-axis and radius 3 units.

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11. Which of the following differential equations has
$y=c_{1} e^{x}+c_{2} e^{-x}$ as the general solution?(A) $\frac{d^{2} y}{d x^{2}}+y=0$
(B) $\frac{d^{2} y}{d x^{2}}-y=0$ (C) $\frac{d^{2} y}{d x^{2}}+1=0$ (D) $\frac{d^{2} y}{d x^{2}}-1=0$

## - Watch Video Solution

12. Which of the following differential equations has $y=x$ as
one of its particular solution?(A) $\frac{d^{2} y}{d x^{2}}-x^{2} \frac{d y}{d x}+x y=x$
(B) $\frac{d^{2} y}{d x^{2}}+x \frac{d y}{d x}+x y=x$ (C) $\frac{d^{2} y}{d x^{2}}-x^{2} \frac{d y}{d x}+x y=0$
${ }^{\prime}\left(d^{\wedge} 2 y\right) /\left(d x^{\wedge} 2\right)+x(d y) /(d x)+x y=0$

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## Exercise 95

1. Show that the given differential equation is homogeneous and solve each of them.
$x^{2} \frac{d y}{d x}=x^{2}-2 y^{2}+x y$

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2. Show that the given differential equation is homogeneous and solve each of them.
$\left(x^{2}-y^{2}\right) d x+2 x y d y=0$

## D Watch Video Solution

3. Show that the given differential equation is homogeneous and solve each of them. $\left\{x \cos \left(\frac{y}{x}\right)+y \sin \left(\frac{y}{x}\right)\right\} y d x=\left\{y \sin \left(\frac{y}{x}\right)-\cos \left(\frac{y}{x}\right)\right\} x d y$

## D Watch Video Solution

4. Show that the given differential equation is homogeneous and solve each of them.
$x d y-y d x=\sqrt{x^{2}+y^{2}} d x$
5. Show that the given differential equation is homogeneous and solve each of them.
$\left(x^{2}+x y\right) d y=\left(x^{2}+y^{2}\right) d x$

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6. Show that the given differential equation is homogeneous and solve each of them. $(x-y) d y-(x+y) d x=0$

## - Watch Video Solution

7. Show that the given differential equation is homogeneous and solve each of them. $y^{\prime}=\frac{x+y}{x}$

## - Watch Video Solution

8. Show that the given differential equation is homogeneous and solve it.
$y d x+x \log \left(\frac{y}{x}\right) d y-2 x d y=0$

## - Watch Video Solution

9. Show that the given differential equation is homogeneous and solve each of them.
$x \frac{d y}{d x}-y+x \sin \left(\frac{y}{x}\right)=0$

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10. A homogeneous differential equation of the from $\frac{d x}{d y}=h\left(\frac{x}{y}\right)$ can be solved by making the substitution.(A) $y=v x$ (B) $v=y x$ (C) $x=v y$ (D) $x=v$

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11. Which of the following is a homogeneous differential equation?(A) $\quad(4 x+6 y+5) d y(3 y+2 x+4) d x=0$ (B)
$(x y) d x-\left(x^{3}+y^{3}\right) d y=0(\mathrm{C})$
$\left(x^{3}+2 y^{2}\right) d x+2 x y d y=0(\mathrm{D})$
$y^{2} d x+\left(x^{2}-x y-y^{2}\right) d y=0$
12. The differential equations, find the particular solution satisfying the given condition: $\frac{d y}{d x}-\frac{y}{x}+\operatorname{cosec}\left(\frac{y}{x}\right)=0 ; y=0$ when $\mathrm{x}=1$

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13. The differential equations, find the particular solution satisfying the given condition:
$2 x y+y^{2}-2 x^{2} \frac{d y}{d x}=0 ; y=2$ when $\mathrm{x}=1$

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14. The differential equations, find the particular solution satisfying the given condition:
$x^{2} d y+\left(x y+y^{2}\right) d x=0 ; \mathrm{y}=1$ when $\mathrm{x}=1$

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15. The differential equations, find the particular solution satisfying the given condition:
$\left[x \sin ^{2}\left(\frac{y}{x}\right)-y\right] d x+x d y=0 ; y=\frac{\pi}{4}$ when $\mathrm{x}=1$

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16. Show that the given differential equation is homogeneous and solve each of them. $\left(1+e^{\frac{x}{y}}\right) d x+e^{\frac{x}{y}}\left(1-\frac{x}{y}\right) d y=0$
17. The differential equations, find the particular solution satisfying the given condition: $(x+y) d y+(x-y) d x=0 ; y=1$ when $x=1$

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## Exercise 91

1. Determine order and degree (if defined) of differential equations given $y^{\prime \prime}+\left(y^{\prime}\right)^{2}+2 y=0$
2. Determine order and degree (if defined) of differential equations given $y^{\prime}+y=e^{x}$

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3. Determine order and degree (if defined) of differential equations given $\frac{d^{4} y}{d x^{4}}+\sin \left(y^{\prime \prime}\right)=0$

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4. Determine order and degree (if defined) of differential
equations given $\left(\frac{d s}{d t}\right)^{4}+3 s \frac{d^{2} s}{d t^{2}}=0$
5. Determine order and degree (if defined) of differential equations given $y^{\prime}+5 y=0$

## D Watch Video Solution

6. Determine order and degree (if defined) of differential equations given $\frac{d^{2} y}{d x^{2}}=\cos 3 x+\sin 3 x$

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7. Determine order and degree (if defined) of differential
equations given $\left(\frac{d^{2} y}{d x^{2}}\right)^{2}+\cos \left(\frac{d y}{d x}\right)=0$
8. Determine order and degree (if defined) of differential equations given $y^{\prime \prime \prime}+2 y^{\prime \prime}+y^{\prime}=0$

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9. Determine order and degree (if defined) of differential equations given $\left(y^{\prime \prime \prime}\right)^{2}+\left(y^{\prime \prime}\right)^{3}+\left(y^{\prime}\right)^{4}+y^{5}=0$

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10. The order of the differential equation
$2 x^{2} \frac{d^{2} y}{d x^{2}}-3 \frac{d y}{d x}+y=0$ is
(A) 2 (B) 1 (C) 0 (D) not defined
11. Determine order and degree (if defined) of differential equations given $y^{\prime}{ }^{\prime}+2 y^{\prime}+\sin y=0$

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12. The degree of the differential equation $\left(\frac{d^{2} y}{d x^{2}}\right)^{3}+\left(\frac{d y}{d x}\right)^{2}+\sin \left(\frac{d y}{d x}\right)+1=0$
(A) 3 (B) 2 (C) 1 (D) not defined

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