doubtnut
India's Number 1 Education App

MATHS

BOOKS - BITSAT GUIDE

DIFFERENTIAL EQUATIONS

Practice Exercise

1. If m and n are order and degree of the differential equation $\left(\frac{d^2y}{dx^2}\right)^5 + \frac{4\left(\frac{d^2y}{dx^2}\right)^3}{\frac{d^3y}{dx^3}} + \frac{d^3y}{dx^3} = x^2 - 1$ (A) $m = 3, n = 1$ (B) $m = 3, n = 3$ (C) $m = 3, n = 2$ (D) $m = 3, n = 5$

A. $m = 3, n = 3$

B. $m = 3, n = 2$

C. $m = 3, n = 5$

D. $m = 3, n = 1$

Answer: B

Watch Video Solution

2. The degree of the differential equation

$$\frac{d^2y}{dx^2} + 3\left(\frac{dy}{dx}\right)^2 = x^2 \log\left(\frac{d^2y}{dx^2}\right), \text{ is}$$

A. 1

B. 2

C. 3

D. None of these

Answer: D

Watch Video Solution

3. The order and degree of the differential equation $\sqrt{\frac{d^2y}{dx^2}} = \sqrt[3]{\frac{dy}{dx} + 5}$ are respectively

A. 2 and 3

B. 3 and 2

C. 2 and 1

D. 2 and 2

Answer: A

Watch Video Solution

4. The order and degree of the differential equation $\left(\frac{d^2y}{dx^2}\right)^{3/2} - \sqrt{\left(\frac{dy}{dx}\right)} - 4 = 0$ are respectively

A. 2 and 6

B. 3 and 6

C. 1 and 4

D. 2 and 4

Answer: A

Watch Video Solution

5. The differential equation whose solution is $(x-h)^2+(y-k)^2=a^2$ is (a is a constant)

A. $\left[1+\left(\frac{dy}{dx}\right)^2\right]^3=a^2\left(\frac{d^2y}{dx^2}\right)$

B. $\left[1+\left(\frac{dy}{dx}\right)^2\right]^3=a^2\left(\frac{d^2y}{dx^2}\right)^2$

C. $\left[1+\left(\frac{dy}{dx}\right)\right]^3=a^2\left(\frac{d^2y}{dx^2}\right)^2$

D. None of these

Answer: B

Watch Video Solution

6. The differential equation of all parabolas with axis parallel to the axis of y is :

A. $y_2 = 2y_1 + x$

B. $y_3 = 2y_1$

C. $y_2^3 = y_1$

D. None of these

Answer: D

Watch Video Solution

7. The order of the differential equation of all circle of radius r, having centre on y-axis and passing through the origin, is

A. 1

B. 2

C. 3

D. 4

Answer: A

Watch Video Solution

8. Find the differential equation whose general solution is given by $y = (c_1 + c_2)\cos(x + c_3) - c_4 e^{x+c}$, where c_1, c_2, c_3, c_4, c_5 are arbitary constants.

A. 5

B. 4

C. 3

D. 2

Answer: C

Watch Video Solution

9. The degree of the differential equation satisfying $\sqrt{1+x^2}+\sqrt{1+y^2}=K\left(x\sqrt{1+x^2}-y\sqrt{1+x^2}\right)$ (1)4 (2)3 (3)1 (4)2

A. 2

B. 3

C. 4

D. None

Answer: D

Watch Video Solution

10. The differential equation of all straight lines which are at a constant distance p from the origin, is

(a) $(y+xy_1)^2=p^2\left(1+y_1^2\right)$

(b) $\left(y-xy_1^2\right)=p^2(1+y_1)^2$

(c) $(y-xy_1)^2=p^2\left(1+y_1^2\right)$

(d) None of these

A. $(y - xy_1)^2 = p^2(1 - x)^2$

B. $(y - xy_1)^2 = p^2(1 + x^2)$

C. $(y - xy_1)^2 = p^2(1 + y_1^2)$

D. $(y + xy_1)^2 = p^2(1 + y_1^2)$

Answer: C

Watch Video Solution

11. The differential equation corresponding to the family of curves $y = e^x(a\cos x + b\sin x)$, where a and b are arbitrary constants, is

A. $2y_2 + y_1 - 3y = 0$

B. $y_2 - 2y_1 + 2y = 0$

C. $2y_2 + 2y_1 - y = 0$

D. $2y_2 - y_1 + 2y = 0$

Answer: B

Watch Video Solution

12. Number of straight lines which satisfy the differential equation $\frac{dy}{dx} + x\left(\frac{dy}{dx}\right)^2 - y = 0$ is

A. 3

B. 2

C. 4

D. None

Answer: B

Watch Video Solution

13. The slope of a curve at any point is the reciprocal of twice the ordinate at that point and it passes through the point(4,3). The equation of the curve is:

A. $x^2 = y + 5$

B. $y^2 = x - 5$

C. $y^2 = x + 5$

D. $x^2 = y - 5$

Answer: C

Watch Video Solution

14. The solution of $\frac{dy}{dx} = \frac{ax + h}{by + k}$ represents a parabola when

A. $a = 0, b = 0$

B. $a + 1, b = 2$

C. $a = 0, b \neq 0$

D. $a = 2, b = 1$

Answer: C

Watch Video Solution

15. The solution of the differential equation :

$2x\frac{dy}{dx} - y = 3$ represents a family of :

A. a straight line

B. a circle

C. a parabola

D. an ellipse

Answer: C

Watch Video Solution

16. If $M\frac{dV}{dt} = F - kV \quad \text{and} \quad V = 0$ what t= 0, then V is given by

A. $V = \frac{k}{F}\left(1 - e^{-kt/M}\right)$

B. $V = \frac{F}{k}\left(1 + e^{-kt/M}\right)$

C. $V = \frac{F}{k}\left(1 - e^{-kt/M}\right)$

D. None of these

Answer: C

View Text Solution

17. The differential equation $\frac{dy}{dx} = \frac{\sqrt{1-y^2}}{y}$ determines a fimily of circular with

A. variable radii and a fixed centre at (0, 1)

B. variable radii and a fixed centre at (0, -1)

C. fixed radius 1 and variable centres along the X-axis

D. fixed radius 1 and variables centres along the Y-axis

Answer: C

Watch Video Solution

18. The equation of a curve passing through $\left(2, \frac{7}{2}\right)$ and having gradient $1 - \frac{1}{x^2}$ at (x, y) is (a) $(b)(c)y = (d)x^{(e)2(f)}(g) + x + 1(h)$ (i) (b) $(j)(k)xy = (l)x^{(m)2(n)}(o) + x + 1(p)$ (q) (c) $(d)(e)xy = x + 1(f)$ (g) (d) None of these

A. $y = x^2 + x + 1$

B. $xy = x^2 + x + 1$

C. $xy = x + 1$

D. None of these

Answer: B

Watch Video Solution

19. The solution of the differential eqaution $\left(x^2 - yx^2\right)\frac{dy}{dx} + y^2 + xy^2 = 0$, is

A. $\log\left(\frac{x}{y}\right) = \frac{1}{x} + \frac{1}{y} + C$

B. $\log\left(\frac{y}{x}\right) = \frac{1}{x} + \frac{1}{y} + C$

C. $\log(xy) = \frac{1}{x} + \frac{y}{y} + C$

D. $\log(xy) + \frac{1}{x} + \frac{1}{y} = C$

Answer: A

Watch Video Solution

20. The solution of $\frac{dy}{dx} = \frac{x\log x^2 + x}{\sin y + y\cos y}$, is

A. $y\sin y = x^2\log x + C$

B. $y\sin y = x^2 + C$

C. $y\sin y = x^2 + \log x + C$

D. $y\sin y = x\log x + C$

Answer: A

View Text Solution

21. A function y = f (x) has a second order derivative f''(x) = 6 (x-1). If the graph passes through the point (2, 1) and at this point tangent to the graph is y = 3x - 1, then function is :

A. $(x+1)^3$

B. $(x-1)^3$

C. $(x+1)^2$

D. $(x-1)^2$

Answer: B

Watch Video Solution

22. The population p(t) at time t of a certain mouse species satisfies the differential equation $\left(dp\frac{t}{dt} = 0.5p(t) - 450 \text{ If } p(0) = 850\right.$, then the time at which the population becomes zero is (1) 2 ln 18 (2) ln 9 (3) $\frac{1}{2}$ ln 18 (4) ln 18

A. 2 log 18

B. log 9

C. $\frac{1}{2}\log 18$

D. log 18

Answer: A

Watch Video Solution

23. If $\frac{dy}{dx} = y + 3 > 0$ and $y(0) = 2$, then at $x =$, $\log_e 2$ the value of y is equal to

A. 5

B. 13

C. -2

D. 7

Answer: D

View Text Solution

24. The solution of $\frac{dy}{dx} = \cos(x+y) + \sin(x+y)$, is

A. $\log\left[1+\tan\left(\frac{x+y}{2}\right)\right] + C = 0$

B. $\log\left[1+\tan\left(\frac{x+y}{2}\right)\right] = x + C$

C. $\log\left[1-\tan\left(\frac{x+y}{2}\right)\right] = x + C$

D. None of the above

Answer: B

View Text Solution

25. The solution of differential equation $(x+y)^2\frac{dy}{dx} = a^2$, is

A. $y = a\tan^{-1}\left(\frac{x+y}{a}\right) + C$

B. $y = a\tan^{-1}\left(\frac{x+y}{2}\right) + C$

C. $y = a\tan^{-1}(+y) + C$

D. $y = \tan^{-1}\left(\frac{x+y}{a}\right) + C$

Answer: A

View Text Solution

26. 8 The solution of differential equation $\frac{dy}{dx} = \frac{y}{x} + \frac{\phi\left(\frac{y}{x}\right)}{\phi'\left(\frac{y}{x}\right)}$ is

A. $x\phi(y/x) = C$

B. $\phi(y/x) = Cx$

C. $y\phi(y/x) = C$

D. $\phi(y/x) = Cy$

Answer: B

Watch Video Solution

27. If $x\frac{dy}{dx} = y(\log y - \log x + 1)$, then the solution of the equation is

A. $\log \frac{x}{y} = Cy$

B. $\log \frac{x}{y} = Cx$

C. $\log \frac{y}{x} = Cy$

D. $\log \frac{y}{x} = Cx$

Answer: D

Watch Video Solution

28. If a curve passes through the point $\left(1, \frac{\pi}{4}\right)$ and its slope $\frac{dy}{dx}$ at any point (x,y) is given by $\frac{dy}{dx} = \frac{y}{x} - \cos^2\left(\frac{y}{x}\right)$, then the equation of the curve is

A. $y = \tan^{-1}\left\{\log\left(\frac{e}{x}\right)\right\}$

B. $y = x\tan^{-1}\left\{\log\left(\frac{x}{e}\right)\right\}$

C. $y = x\tan^{-1}\left\{\log\left(\frac{e}{x}\right)\right\}$

D. None of these

Answer: C

View Text Solution

29. The solution of the differential equation $(x-y)dy-(x+y)dx=0,$ is

A. $\tan^{-1}\frac{x}{y}+\frac{1}{2}\log(x^2+y^2)=C$

B. $\tan^{-1},\frac{y}{x}-\frac{1}{2}\log(x^2+y^2)=C$

C. $\cot^{-1}\left(\frac{y}{x}\right)+\frac{1}{2}\log(x^2+y^2=C$

D. None of the above

Answer: B

View Text Solution

30. The solution of the differential equation $y^2dx+\left(x^2-xy+y^2\right)dy=0$ is

A. $\tan^{-1}\left(\frac{x}{y}\right) + \log y + C = 0$

B. $2\tan^{-1}\left(\frac{x}{y}\right) + \log x + C = 0$

C. $\log\left(y + \sqrt{x^2 + y^2}\right) + \log y + C = 0$

D. $\sin^{-1}\left(\frac{x}{y}\right) + \log y + C = 0$

Answer: A

Watch Video Solution

31. The solution of the differential equation $\frac{dy}{dx} = \frac{xy}{x^2 + y^2}$ is

A. $ay^2 = \frac{e^{x^2}}{e^{y^2}}$

B. $ay = ex^{x/y}$

C. $y = e^{x^2} + e^{y^2} + C$

D. $y = e^{x^2} + y^2 + C$

Answer: A

Watch Video Solution

32. The solution of differential equation

$ydx + \left(2\sqrt{xy} - x\right)dy = 0$ is

A. $\log|y| - \sqrt{\frac{x}{y}} = C$

B. $\log|y| + \sqrt{\frac{x}{y}} = C$

C. $\log|y| + 2\sqrt{\frac{x}{y}} = C$

D. None of these

Answer: B

Watch Video Solution

33. The solution of the differential equation

$x^2 \frac{dy}{dx} = x^2 + xy + y^2$

A. $\tan^1\left(\frac{y}{x}\right) = 2\log x + C$

B. $\tan^{-1}\left(\frac{y}{x}\right) = 3\log x + C$

C. $\tan^{-1}\left(\frac{y}{x}\right) = \log x + C$

D. $\tan^{-}\left(\frac{y}{x}\right) = 4\log x + C$

Answer: C

Watch Video Solution

34. Which of the following is the integrating factor of $x \log x \frac{dy}{dx} + y = 2\log x$?

A. x

B. e^x

C. $\log x$

D. $\log(\log x)$

Answer: C

Watch Video Solution

35. The solution of the differential equation $(1+y^2)dx + \left(x - e^{-\tan^{-1}y}\right)dy = 0$ is

A. $ye^{\tan^{-1}x} = \tan^{-1}x + C$

B. $xe^{\tan^{-1}y} = \tan^{-1}y + C$

C. $y = \tan^{-1}xe^{\tan^{-1}x} + C$

D. $y = xe^{\tan^{-1}x} + C$

Answer: B

View Text Solution

36. The solution of the differential equation is $\cos^2 x\frac{dy}{dx} - (\tan 2x)y = \cos^4 x, |x| < \frac{\pi}{4}$, where $y\left(\frac{\pi}{6}\right) = \frac{3\sqrt{3}}{8}$ is

A. $\frac{1}{2}, \frac{\cos 2x}{1-\tan^2 x}$

B. $\frac{1}{2}, \frac{\sin 2x}{1-\tan^2 x}$

C. $\frac{\sin 2x}{1+\tan^2 x}$

D. None of these

Answer: B

View Text Solution

37. Solution of the differential equation $x\frac{dy}{dx} + 2y = x^2 \log x$ is

A. $16yx^2 = x^4 \log\left(x^4 \ / \ e\right) + C$

B. $yx^2 = \frac{1}{4}x^4 \log x - \frac{1}{6}x^4 + C$

C. $16yx^2 = 4x^4 \log x - x^4 + C$

D. All of the above

Answer: D

Watch Video Solution

38. If $\phi(x)$ is a differentiable function, then the solution of the different equation $dy + \{y\phi'(x) - \phi(x)\phi'(x)\}dx = 0,$ is

A. $y = \{\phi(x) - 1\} + Ce^{-\phi(x)}$

B. $y\phi(x) = \{\phi(x)\}^2 + C$

C. $ye^{\phi}(x) = \phi(x)e^{\phi(x)} + C$

D. None of these

Answer: A

Watch Video Solution

39. $\frac{dy}{dx} + \frac{3x^2}{1+x^3}y = \frac{\sin^2 x}{1+x^3}$

A. $y(1+x^3) = x + \frac{1}{2}\sin 2x + C$

B. $y(1+x^3) = Cx + \frac{1}{2}\sin 2x$

C. $y(1+x^3) = Cx - \frac{1}{2}\sin 2x$

D. $y\left(1+x^3\right)=\frac{x}{2}-\frac{1}{4}\sin 2x+C$

Answer: D

Watch Video Solution

40. Consider the differential equation $y^2dx+\left(x-\frac{1}{y}\right)dy=0$ if $y(1)=1$ then x is

A. $1-\frac{1}{y}+\frac{e^{1/y}}{e}$

B. $4-\frac{2}{y}-\frac{e^{1/y}}{e}$

C. $3-\frac{1}{y}+\frac{e^{1/y}}{e}$

D. $1+\frac{1}{y}-\frac{e^{1/y}}{e}$

Answer: D

Watch Video Solution

41. The solution of differential equation $\frac{dy}{dx} - 3y\cot x = \sin 2x,$ where $y = 2$ and $x = \frac{\pi}{2}$ is

A. $y = 4\sin^3 x + 2\sin^2 x$

B. $y = 4\sin^3 x - 2\sin^2 x$

C. $y = 2\sin^3 x + 4\sin^2 x$

D. $y = 2\sin^3 x - 4\sin^2 x$

Answer: B

View Text Solution

42. The solution of differential equation

$$\left[\frac{e^{-2\sqrt{2}}}{\sqrt{x}} - \frac{y}{\sqrt{xy}}\right]\frac{dx}{dy} = 1, (x \neq 0) \text{ is}$$

A. $ye^{2\sqrt{x}} = 2\sqrt{x} + C$

B. $ye^{2\sqrt{x}} = 3\sqrt{x} + C$

C. $2ye^{2\sqrt{x}} = 3\sqrt{+C}$

D. $ye^{\sqrt{x}} = 2\sqrt{x} + C$

Answer: A

Watch Video Solution

43. The solution of differential equation

$$(x^2 - 1)\frac{dy}{dx} + 2xy = \frac{1}{x^2 - 1} \text{ is}$$

A. $y(x^2 - 1) = \frac{1}{2}\log\left|\frac{x-1}{x+1}\right| + C$

B. $y(x^2 - 1) = \frac{1}{2}\log\left|\frac{x-1}{x+1}\right| + C$

C. $y(x^2 + 1) = \frac{1}{3}\log\left|\frac{x-1}{x+1}\right| + C$

D. $y(x^2 - 1) = \frac{1}{3}\log\left|\frac{x-1}{x+1}\right| + C$

Answer: A

Watch Video Solution

44. solution of differential equation $x\cos x\frac{dy}{dx}+y(x\sin x+\cos x)=1$ is

A. $xy=\sin x+C\cos x$

B. $xy+\cos x+C\sin x=0$

C. $xy+\sec x+C\sin x=0$

D. None of these

Answer: A

Watch Video Solution

45. The solution of differential equation

$\cos x dy=y(\sin x-y)dx, 0<x<\pi/2$ is

A. $\sec x=(\tan x+C)y$

B. $y\sec x=\tan x+C$

C. $y\tan x=\sec x+C$

D. $\tan x = (\sec x + C)y$

Answer: A

Watch Video Solution

46. The solution of differential equation

$(xy^5 + 2y)dx - xdy = 0,$ is

A. $9x^8 + 4x^9y^4 = 9y^4C$

B. $9x^8 - 4x^9y^4 - 9y^4C = 0$

C. $x^8(9 + 4y^4) = 10y^4C$

D. None of the above

Answer: A

Watch Video Solution

47. The solution of the differential equation

$\frac{dy}{dx} = e^{x-y}(e^x - e^y)$ is

A. $e^y = (e^x + 1) + Ce^{-e^x}$

B. $e^y = (e^x - 1) + C$

C. $e^y = (e^x - 1) + Ce^{-e^x}$

D. None of these

Answer: C

Watch Video Solution

48. If y=f(x) passing through (1,2) satisfies are differential equation y(1+xy)dx-x dy=0, then

A. $f(x) = \frac{2x}{2 - x^2}$

B. $f(x) = \frac{x + 1}{x^2 + 1}$

C. $f(x) = \frac{x - 1}{4 - x^2}$

D. $f(x) = \frac{4x}{1 - x^2}$

Answer: A

Watch Video Solution

49. If x dy = y (dx + y dy) , y (1) = 1 and y (x) $>$ 0 , then what is y (-3) equal to

A. 3

B. 2

C. 1

D. 0

Answer: A

Watch Video Solution

50. The solution of the differential equation

$xdx + ydx = \dfrac{xdy - ydx}{x^2 + y^2} = 0$ is

A. $y = x\tan\left(\dfrac{x^2 + y^2 + C}{2}\right)$

B. $x = y\tan\left(\dfrac{x^2 + y^2 + C}{2}\right)$

C. $y = x\tan\left(\dfrac{C - x^2 - y^2}{2}\right)$

D. None of these

Answer: C

Watch Video Solution

Bitsat Archives

1. The form of the differential equation of the central conics $ax^2 + by^2 = 1$ is

A. $x = y\dfrac{dy}{dx}$

B. $x\left(\frac{dy}{dx}\right)^2 + xy\frac{d^2y}{dx^2} - y\frac{dy}{dx} = 0$

C. $x + y\frac{d^2y}{dx^2} = 0$

D. None of the above

Answer: B

View Text Solution

2. The solution of the differential equation

$$\frac{x + \frac{x^3}{3!} + \frac{x^5}{5!} +}{1 + \frac{x^2}{2!} + \frac{x^4}{4!} +} = \frac{dx - dy}{dx + dy} is$$ (a)

$(b)(c)2y(d)e^{(e)\,(f)\,2x\,(g)}\,(h) = C(i)e^{(j)\,(k)\,2x\,(l)}\,(m) + 1(n)$ (o) (p)

$(q)(r)2y(s)e^{(t)\,(u)\,2x\,(v)}\,(w) = C(x)e^{(y)\,(z)\,2x\,(aa)}\,(bb) - 1(cc)$ (dd) (ee)

$(ff)(gg)y(hh)e^{(ii)\,(jj)\,2x\,(kk)}\,(ll) = C(mm)e^{(nn)\,(\infty)\,2x\,(pp)}\,(qq) + 2(rr)$

(ss) (d) None of these

A. $2yr^{2x} = Ce^{2x} + 1$

B. $2ye^{2x} = Ce^{2x} - 1$

C. $ye^{2x} = Ce^{2x} + 2$

D. None of these

Answer: B

Watch Video Solution

3. The solution of the differential equation

$$x = 1 + xy\frac{dy}{dx} + \frac{x^2y^2}{2!}\left(\frac{dy}{d}\right)^2 + \frac{x^3y^3}{3!}\left(\frac{dy}{dx}\right)^3 + is$$ (a)

$(b)(c)y = 1n((d)x(e)) + c(f)$ (g) (b)

$(h)(i)(j)y^{(k)2(l)}(m) = (n)(o)((p)(q)1nx(r))^{(s)2(t)}(u) + c(v)$ (w) (c)

$(d)(e)y = \log x + xy(f)$ (g) (d) $(h)(i)xy = (j)x^{(k)y(l)}(m) + c(n)$ (o)

A. $y = \log x + C$

B. $y^2 = (\log x)^2 + C$

C. $y = \log x + xy$

D. $xy = x^y + C$

Answer: B

Watch Video Solution

Watch Video Solution

4. The general solution of the differential equation $\frac{dy}{dx} + \frac{\sin(x+y)}{2} = \frac{\sin(x-y)}{2}$ is (a) $(b)(c)\log\tan\left((d)(e)(f)\frac{y}{g}2(h)(i)(j)\right) = c - 2\sin x(k)$ (l) (m) *[Math Processing Error]* (ee) (ff) *[Math Processing Error]* (uu) (vv) $(ww)(\times)\log\tan\left((yy)(zz)(aaa)\frac{y}{bbb}4(ccc)(ddd) + (eee)\frac{\pi}{fff}4(ggg)(hhh)\right.$ (rrr)

A. $\log\tan\left(\frac{y}{2}\right) + C - 2\sin x$

B. $\log\tan\left(\frac{y}{4}\right) = C - 2\sin\left(\frac{x}{2}\right)$

C. $\log\tan\left(\frac{y}{2} + \frac{\pi}{4}\right) = C - 2\sin x$

D. None of the above

Answer: B

Watch Video Solution

5. By eliminating the arbitrary constant A and B from $y = Ax^2 + Bx$ we get the differential equation

A. $\frac{d^3y}{dx^3} = 0$

B. $x^2\frac{d^2y}{dx^2} - 2x\frac{dy}{dx} + 2y = 0$

C. $\frac{d^2y}{dx^2} = 0$

D. $x^2\frac{d^2y}{dx^2} + y = 0$

Answer: B

Watch Video Solution

6. The order and degree of the differential equation $\sqrt{\frac{dy}{dx}} - 4\frac{dy}{dx} - 7x = 0$ are

A. $1 \text{ and } \frac{1}{2}$

B. 2 and 1

C. 1 and 1

D. 1 and 2

Answer: D

Watch Video Solution

7. The differential equation of all non-vertical lines in a plane, is

A. $\frac{d^2y}{dx^2} = 0$

B. $\frac{d^2x}{dy^2} = 0$

C. $\frac{dy}{dx} = 0$

D. $\frac{dx}{dy} = 0$

Answer: A

Watch Video Solution

8. The solution of $\frac{dy}{dx} = \frac{\alpha x + g}{by + f}$ represents a circle, when

A. a = b

B. $a = -b$

C. $a = -2b$

D. a = 2b`

Answer: B

Watch Video Solution

9. the equation of the curve satisfying the equation $(xy - x^2)\frac{dy}{dx} = y^2$ and passing through the point $(-1, 1)$, is

A. $y = (\log y - 1)x$

B. $y = (\log y + 1)x$

C. $x = (\log x - 1)y$

D. $x = (\log x - 1)y$

Answer: A

View Text Solution

10. The solution of the differential equation $\frac{dy}{dx} = \frac{xy + y}{xy + x}$ is

A. $x + y - \log\left(\frac{cy}{x}\right)$

B. $x + y = \log(Cxy)$

C. $x - y - \log\left(\frac{cx}{y}\right)$

D. $y - x = \log\left(\frac{Cx}{y}\right)$

Answer: D

Watch Video Solution

11. The solution of the differential equation $xy^2dy - \left(x^3 + y^3\right) + C$

A. $y^3 = 3x^3 + C$

B. $y^3 = 3x^3 \log(Cx)$

C. $y^3 = 3x^3 + \log(Cx)$

D. $y^3 + 3x^3 = \log(Cx)$

Answer: B

View Text Solution

12. The solution of the differential equation $\frac{dy}{dx} - y\tan x = e^x \sec x$ is

A. $y = e^x \cos x + C$

B. $y\cos x = e^x + C$

C. $y = e^x \sin x + C$

D. $y\sin x = e^x + C$

Answer: B

Watch Video Solution

13. The solution of differential equation $\frac{dy}{dx} + \frac{2xy}{1+x^2} = \frac{1}{(1+x^2)^2}$ is

A. $y(1+x)^2 = C + \tan^{-1} x$

B. $\frac{y}{1+x^2} = C + \tan^{-1} x$

C. $y\log\left(1+x^2\right) = C + \tan^{-1} x$

D. $y\left(1+x^2\right) = C + \sin^{-1} x$

Answer: A

Watch Video Solution

14. Which one of the following differential equation represents the system of circles touching y-axis at the origin ?

A. $x^2 + y^2 - 2xy\frac{dy}{dx} = 0$

B. $x^2 + y^2 + 2xy\frac{dy}{dx} = 0$

C. $x^2 - y^2 - 2xy\frac{dy}{dx} = 0$

D. $x^2 - y^2 + 2xy\frac{dy}{dx} = 0$

Answer: D

Watch Video Solution

15. The general solution of the differential equation $(2x - y + 1)dx + (2y - x + 1)dy = 0$ is

A. $x^2 + y^2 + xy - x + y = C$

B. $x^2 + y^2 - xy + x + y = C$

C. $x^2 - y^2 + 2xy - x + y = C$

D. $x^2 - y^2 - 2xy + x - y = C$

Answer: B

View Text Solution

16. The degree of the differential equation $y(x) = 1 + \frac{dy}{dx} + \frac{1}{1 \cdot 2}\left(\frac{dy}{dx}\right)^2 + \frac{1}{1 \cdot 2 \cdot 3}\left(\frac{dy}{dx}\right)^3 + \ldots.$ is

A. 2

B. 3

C. 1

D. None of these

Answer: C

View Text Solution

17. The solution of $x^2 + y^2 - 2xy\frac{dy}{dx} = 0$ is

A. $x^2 - y^2 = Cx$

B. $x^2 + y^2 = Cx$

C. $2\left(x^2 - y^2\right) = Cx$

D. None of these

Answer: A

Watch Video Solution