Differential equation of the curve is?

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FORMATION OF DIFFERENTIAL EQUATIONS

1) A curve passes through the point (4, 2) and at any point (x, y) on it the product of its slope and the ordinate is equal to abscissa of the curve is
1) parabola 2) Ellipse
3) Circle 4) Hyperbola

2) The differential equation of the family of circles whose centre lies on x-axis and passing through origin is
1) $x^2+y^2+\frac{dy}{dx}=0$
2) $(y^2-x^2)dx-2xydy=0$
3) $y^2dx+(x^2+2xy)dy=0$
4) $xdy+ydx+x^2dx+y^2dy=0$

3) The D.E of the family of parabolas of which has a latusrectum 4a and whose axes are parallel to x-axis
1) $y_1^3+2ay_2=0$ 2) $y_1^3+ay_2=0$
3) $y_1^3+4ay_2=0$ 4) $y_1^3+3ay_2=0$

4) Assume that a spherical rain drop evaporates at a rate proportional to its surface area, the differential equation involving the rate of change of the radius of rain drop
1) $\frac{dr}{dt}=k$ 2) $\frac{dr}{dt}=-k$
3) $\frac{d^2r}{dt^2}=k$ 4) $\frac{d^2r}{dt^2}=-k$

5) The D.E whose solution is $y=c_1e^x+c_2e^{-x}+c_3sinx+c_4cosx$ is
1) $y_4=y_2$ 2) $y_4=y_3$
3) $y_4=y_1$ 4) $y_4=y$

6) The D.E whose solution is $y=c^2+\frac{c}{x}$ is
1) $y=x^4y_1-xy_1^2$ 2) $y=x^4y_1^2+xy_1$
3) $y=x^4y_1^2-xy_1$ 4) $y=x^4y_1^2+2xy_1$

7) The differential equation of all non-vertical lines in a plane is
1) $\frac{d^2y}{dx^2}=0$ 2) $\frac{d^2x}{dy^2}=0$
3) $\frac{dy}{dx}=0$ 4) $\frac{dx}{dy}=0$

8) The D.E whose solution is $y=acosx+bsinx+xsinx$ is
1) $y_2+y=cosx$ 2) $y_2+y=sinx$
3) $y_2+y=2sinx$ 4) $y_2+y=2cosx$

9) The D.E whose solution is $xy=ae^x+be^{-x}$ is
1) $xy_2+2y_1=xy$ 2) $xy_2-2y_1=xy$
3) $xy_2-2y_1+xy=0$
4) $xy_2-2y_1+xy=0$

10) Differential equation having general solution $y=(sin^{-1}x)^2+A(cos^{-1}x)+B$ where A, B are arbitrary constants is
1) $(1-x^2)y_2-xy_1=0$
2) $(1-x^2)y_2-xy_1=1$
3) $(1-x^2)y_2-xy_1=2$
4) $(1-x^2)y_2-xy_1=4$

11) A normal at any point (x, y) to the curve y=f(x) cuts a triangle of unit area with the axis, the differential equation of the curve is
1) $y^2-x^2\left(\frac{dy}{dx}\right)^2=4\frac{dy}{dx}$
2) $x^2-y^2\left(\frac{dy}{dx}\right)^2=\frac{dy}{dx}$
3) $y^2\left(\frac{dy}{dx}\right)^2+2(xy-1)\frac{dy}{dx}+x^2=0$
4) $x+y\left(\frac{dy}{dx}\right)=y$

SOLUTIONS OF THE DIFFERENTIAL EQUATIONS VARIABLE SEPARABLE

12) If $\frac{dy}{dx}=e^{-2y}$ and y=0 when x=5, the value of x for y=3 is
1) e^5 2) e^6+1 3) $\frac{e^6+9}{2}$ 4) $\log_e 6$

13) The differential equation $y\frac{dy}{dx}+x=A$ where A is a constant represents a set of
1) circles centre at y-axis

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2) circles centre at x-axis
3) parabolas 4) ellipses

14) The family passing through (0,0) and satisfying the differential equation $\frac{y_2}{y_1}=1$ (where $y_n=\frac{d^ny}{dx^n}$) is
1) y = k 2) y = kx
3) y = k(e^x+1) 4) y = k(e^x-1)

15) The solution of $\frac{dy}{dx}=xlogx$
1) $2y=x^2\left[logx+\frac{1}{2}\right]+c$
2) $2y=x^2\left[logx-\frac{1}{2}\right]+c$
3) $y=\frac{x^2}{2}(log2-x)+c$
4) $y^2=x^2logx+x+c$

16) The solution of $\sqrt{1-x^2}sin^{-1}xdy+ydx=0$
1) $ytan^{-1}x=c$ 2) $ysin^{-1}x=c$
3) $ycos^{-1}x=c$ 4) $xsin^{-1}y=c$

17) The solution of $xdx+ydy+(x^2+y^2)dy=0$
1) $(x^2+y^2)e^{2y}=c$ 2) $(x^2+y^2)=cxy$
3) $(x^2+y^2)=cx^2$ 4) $(x^2+y^2)e^{2x}=c$

18) The solution of $xdx+ydy=x^2ydy-xy^2dx$ is
1) $x^2-1=c(1+y^2)$
2) $x^2+1=c(1-y^2)$
3) $x^3-1=c(1+y^3)$
4) $x^3-1=c(1+y^3)$

19) The solution of $(x+y+1)\frac{dy}{dx}=1$ is
1) $x=-(y+2)+ce^y$
2) $y=-(x+2)+ce^x$
3) $x=-(y+2)+ce^x$
4) $x=(y+2)+ce^{-y}$

20) Solution of $x+y=cos^{-1}\left(\frac{dy}{dx}\right)$ is
1) $x+c=tan\left(\frac{x+y}{2}\right)$ 2) $x+c=sin\left(\frac{x+y}{2}\right)$
3) $x+c=sec\left(\frac{x+y}{2}\right)$ 4) $x+c=cosec\left(\frac{x+y}{2}\right)$

21) Solution of $(x-y)^2\frac{dy}{dx}=a^2$
1) $2y=c+alog\left(\frac{x-y-a}{x-y+a}\right)$
2) $y=c+alog\left(\frac{x-y+a}{x-y-a}\right)$
3) $2y=c-alog\left(\frac{x-y}{x+y}\right)$
4) $2y^2=c+log\left(\frac{x-y+a}{x-y-a}\right)$

22) The solution of $\frac{dy}{dx}+1=e^{x+y}$ is
1) $e^{-(x+y)}+x+c=0$
2) $e^{-(x+y)}-x+c=0$
3) $e^{x+y}+x+c=0$
4) $e^{x+y}-x+c=0$

23) Equation of the curve whose gradient at any point (x, y) on it is $\frac{x-a}{y-b}$ and which passes through the origin is
1) $x^2-y^2=2(ax-by)$
2) $x^2+y^2=2(ax+by)$
3) $x^2-y^2=2(bx+ay)$
4) $x^2+y^2=2(ax-by)$

24) Equation of the curve whose sub tangent is constant is
1) $y^2=ce^{\frac{x^2}{k}}$ 2) $y=cx^2$
3) $y=ce^{\frac{x}{k}}$ 4) $y=ce^{x^2}$

25) The solution of $(1+sin^2x)dy+cosx(1+y^2)dx=0$ given that y=2 when, $x=\frac{\pi}{2}$
1) $y=\frac{sinx+3}{3sinx-1}$ 2) $y=\frac{3(sinx-1)}{sinx+3}$
3) $y=\frac{3sinx+1}{sinx-3}$ 4) $y=\frac{sinx+3}{sinx+1}$

26) Equation of the curve passing through (0,0) and satisfying the equation $\frac{dy}{dx}=(x-y)^2$
1) $e^{2x}(1-x+y)=1+x-y$
2) $e^{2x}(1+x-y)=1-x+y$
3) $e^{2x}(1-x+y)=-(1+x+y)$
4) $e^{2x}(1+x+y)=1-x+y$

27) The solution of $e^x\sqrt{1-y^2}dx+\frac{y}{x}dy=0$
1) $(x-1)^2e^x=(1-y^2)+c$
2) $(x+1)e^x=\sqrt{1-y^2}+c$
3) $x.e^x=\sqrt{1-y^2}+c$
4) $(x-1)e^x=\sqrt{1-y^2}+c$

28) The solution is $sin^{-1}ydx+\frac{x}{\sqrt{1-y^2}}dy=0$ is
1) $ysin^{-1}x=c$ 2) $y=csin^{-1}x$
3) $y=\sin\left(\frac{c}{x}\right)$ 4) $x=c\sin y$

HOMOGENEOUS EQUATIONS

29) The solution of $(x^3-3xy^2)dx=(y^3-3x^2y)dy$
1) $y^2-x^2=c(x^2+y^2)^2$
2) $y^3-x^3=c(x^2+y^2)$
3) $y^2+x^2=c(x^2+y^2)$
4) $y^3+x^3=c(x^2-y^2)$

NON-HOMOGENEOUS EQUATIONS

30) The solution of $(2x+3y-5)dx+(3x-4y+1)dy=0$
1) $x^2+3xy-2y^2-5x+y=c$
2) $x^2+3xy-4y^2-5x-y=c$
3) $x^2+3y^2-2xy+5x+y=c$
4) $x^2-3y^2-2xy+5x+y=c$

31) The solution of $\frac{dy}{dx}=\frac{x-2y+3}{2x-y+5}$
1) $x^2-2xy+y^2+3x-5y=c$
2) $x^2-4xy+y^2+6x-10y=c$
3) $x^2-4xy-y^2-3x+5y=c$
4) $x^2-2xy+2y^2+6x-5y=c$

INTEGRATING FACTORS OF DIFFERENTIAL EQUATION

32) I.F of $x\frac{dy}{dx}+y(1+x)=1$
1) $x.e^x$ 2) $\frac{e^x}{x}$
3) $x+\log x$ 4) $x\log x$

33) I.F of $xsinx\frac{dy}{dx}+y(xcosx+sinx)=sinx$
1) $xcos\,x$ 2) $xsec\,x$
3) $x\sin x$ 4) $x\,cosec\,x$

LINEAR DIFFERENTIAL EQUATIONS

34) The general solution of the differential equation $ydx-(x+2y^2)dy=0$
1) $y=2x^2+cx$ 2) $x=2y^2+cy$
3) $x^2=y^2+cy$ 4) $y=x^2+c$

35) $y+x^2=\frac{dy}{dx}$ has the solution
1) $y+x^2+2x+2=c.e^x$
2) $y+x+2x^2+2=c.e^x$
3) $y+x+x^2+2=c.e^{2x}$
4) $y^2+x+x^2+2=c.e^{2x}$

36) If y(t) is a solution of $(1+t)\frac{dy}{dt}-ty=1$ and y(0)=-1 then y(1) is equal to
1) $-\frac{1}{2}$ 2) $e+\frac{1}{2}$ 3) $e-\frac{1}{2}$ 4) $\frac{1}{2}$

37) $x\frac{dy}{dx}+y-x+xycotx=0(x\neq 0)$
1) $y(xsinx)=-xcosx+sinx+c$
2) $x(xsinx)=xcosx-sinx+c$
3) $ysinx=-xcosx+2sinx+c$
4) $ycosx=xsinx+2cosx+c$

38) The solution of $sin2x\left(\frac{dy}{dx}\right)-y=tanx$
1) $x-ysinx=c$ 2) $xytanx=c$
3) $y=tanx+c$ 4) $y=tanx+c\sqrt{tanx}$

BERNOULLI EQUATION

39) Which of the following transformation reduces the differential equation $\frac{dz}{dx}+\frac{z}{x}logx=\frac{z}{x^2}(\log z)^2$ into the form $\frac{du}{dx}+uP(x)=Q(x)$
1) u = logz 2) u = e^z
3) u = (log z)^{-1} 4) u = (log z)^2

40) The solution of $sec^2y\frac{dy}{dx}+2xtany=x^3$ is given by $x^2-2tany+ce^{-x^2}=\lambda$ where λ
1) -2 2) -1 3) 1 4) 2

Answer Key									
1)	4	2)	2	3)	1	4)	2	5)	4
6)	3	7)	1	8)	4	9)	1	10)	3
11)	3	12)	3	13)	2	14)	4	15)	2
16)	2	17)	1	18)	1	19)	1	20)	1
21)	1	22)	1	23)	1	24)	3	25)	1
26)	1	27)	4	28)	3	29)	1	30)	1
31)	2	32)	1	33)	3	34)	2	35)	1
36)	1	37)	1	38)	4	39)	3	40)	3