The necessary and sufficient condition for the differential equation $Mdx + Ndy = 0$ to be exact is

a) $\frac{\partial M}{\partial y} = N$ b) $\frac{\partial N}{\partial x} = M$ c) $\frac{\partial M}{\partial y} - \frac{\partial N}{\partial x} = 0$ d) $\frac{\partial M}{\partial y} + \frac{\partial N}{\partial x} = 0$

- ○ a
- ○ b
- ◉ c
- ○ d
- ○ Other: .....

The solution of an exact differential equation $\left(y\left(1+\frac{1}{x}\right)+\cos y\right)dx + (x + \log x - x\sin y)dy = 0$ is

a) $(x + \log x)y + x\cos y = c$ b) $(x + \log x) + \cos\ y = c$

c) $(x + \log x) - \sin\ y = c$ d) None of these

- ◉ a
- ○ b
- ○ c
- ○ d

The solution of the differential equation $(x^2 - ay)dx = (ax - y^2)dy$

a) $x^3 - 3axy = c$ b) $x^3 - 3axy + y^3 = c$ c) $x^3 + y^3 = c$ d) None of these

- ○ a
- ◉ b
- ○ c
- ○ d

An integrating factor of the differential equation of the type $f_1(xy)ydx + f_2(xy)xdy = 0$ is given by

a) $\frac{1}{Mx}$ b) $\frac{1}{Mx+Ny}$, $Mx + Ny \neq 0$ c) $\frac{1}{Mx-Ny}$, $Mx - Ny \neq 0$ d) $\frac{1}{My}$, $My \neq 0$

- a
- b
- c
- d

In the differential equation $Mdx + Ndy = 0$, if $\frac{\frac{\partial M}{\partial y} - \frac{\partial N}{\partial x}}{N} = f(x)(say)$ then its integrating factor is given by

a) $\int f(x)dx$ b) $e^{-\int f(x)dx}$ c) $e^{\int f(x)dx}$ d) None of these

- a
- b
- c
- d

The integrating factor of the differential equation $(xy^3 + y)dx + 2(x^2y^2 + x + y^4)dy = 0$ is

a) xy b) e^y c) $e^{\log y}$ d) x

- a
- b
- c
- d

The integrating factor of the differential equation $y(xy + 2x^2y^2)dx + x(xy - x^2y^2)dy = 0$ is

a) $\frac{1}{x^3y^2}$ b) $\frac{1}{x^3y^4}$ c) $\frac{1}{x^2y^3}$ d) $\frac{1}{x^3y^3}$

- ○ a
- ○ b
- ○ c
- ◉ d

The solution of the differential equation $x\,dx - y\,dy + a(x^2 + y^2)dx = 0$ is

a) $ax + c = 0$ b) $\tan^{-1}\frac{x}{y} = c$ c) $\tan^{-1}\frac{x}{y} + ax = c$ d) None of these

- ○ a
- ○ b
- ◉ c
- ○ d

Solution of the differential equation $p = \sin(y - xp)$, where $p = \frac{dy}{dx}$ is

a) $y = \frac{c}{x} + \sin^{-1} c$ b) $y = cx + \sin^{-1} c$ c) $y = x + \sin^{-1} c$ d) None of these

- ○ a
- ◉ b
- ○ c
- ○ d

Solution of the differential equation $y\left(\frac{dy}{dx}\right)^2 + (x-y)\left(\frac{dy}{dx}\right) - x = 0$, is

a) $(x-y+c)(x^2+c)=0$ b) $(x-y+c)(x^2+y^2+c)=0$

c) $(x-y+c)^2(x^2+y^2+c)=0$ d) None of these

- a
- b
- c
- d

The solution of the differential equation $y = px + \sin^{-1} p$ is

(a) $y = \sin^{-1} c$ (b) $y = cx + \sin^{-1} c$ (c) $y = cx$ (d) $y = pc + \sin^{-1} p$

- a
- b
- c
- d

General solution of $xp^2 - yp + a = 0$, where $p = \frac{dy}{dx}$ is

a) $y = cx + \frac{a}{c^2}$ b) $y = cx + \frac{a}{c}$ c) $y = \frac{a}{c}$ d) $y = cx + \log c$

- a
- b
- c
- d

Solution of the differential equation $y\,logy\,dx + (x - \log y)dy = 0$ is given by

a) $x\log y + x^3 + y = c$ b) $x\log y + \frac{1}{2}(\log y)^2 = c$

c) $x\log y - \frac{1}{2}\log y = c$ d) $x\log y - \frac{1}{2}(\log y)^2 = c$

- a
- b
- c
- d

The integrating factor of the differential equation $(2 + x^2y^2)y\,dx + (2 - x^2y^2)xdy = 0\ is.$

(a) $\frac{1}{2(xy)^3}$ (b) $\frac{-1}{(xy)^6}$ (c) $\frac{-1}{2(xy)^2}$ (d) $\frac{1}{2xy}$

- a
- b
- c
- d

The integrating factor of the differential equation $x^2y\,dx - (x^3 + y^3)dy$=0 is

(a) $\frac{-1}{(y)^4}$ (b) $\frac{-1}{(y)^6}$ (c) $\frac{1}{(y)^2}$ (d) $\frac{1}{xy}$

- a
- b
- c
- d

Q Which of the following equations is an exact differential equation?

(a) $(x^2+2y)dx-xydy=0$ (b) $xdy+(2x+3y)dx=0$

(c) $x^2ydy-ydx=0$ (d) $2xy^2dx+(1+2x^2y)dy=0$

- a
- b
- c
- (●) d

General solution of $p=\log(px-y)$, where $p=\frac{dy}{dx}$ is

a) $y=cx+c$ b) $y=cx+\log c$ c) $y=cx-e^c$ d) $y=cx^2-e^c$

- a
- b
- (●) c
- d

The solution of the differential equation $ye^{xy}dx+(xe^{xy}+2y)dy=0$ *is .?*

(a) $e^{xy}+y^2=c$ (b) $e^{xy}-y^2=c$ (c) $e^{xy}+y=c$ (d) $e^{xy}-y=c$

- (●) a
- b
- c
- d

Solution of the differential equation $x\,dx + y\,dy + \frac{x\,dx - y\,dy}{x^2+y^2} = 0$ is

a) $x^2 + y^2 + \tan^{-1}\frac{y}{x} = c$

b) $x^2 + y^2 + 2\tan^{-1}\frac{y}{x} = c$

c) $x^2 + \tan^{-1}\frac{y}{x} = c$

d) $xy + \tan^{-1}\frac{y}{x} = c$

- ○ a
- ◉ b
- ○ c
- ○ d

The differential equation $(x + x^8 + ay^2)dx + (y^8 - y + bxy)dy = 0$ is exact if

(a)b=2a (b) a=b (c) a=3b (d) a=1 , b=3

- ◉ a
- ○ b
- ○ c
- ○ d

The integrating factor of the differential equation $xdy + ydx = x^3y^6dy$ *is.*

(a) $\frac{1}{(xy)^3}$ (b) $\frac{1}{(xy)^6}$ (c) $\frac{1}{(xy)^2}$ (d) $\frac{1}{xy}$

- (●) a
- ( ) b
- ( ) c
- ( ) d

the solution of differential equation $py - x = 0$ *is.*

(a) $x^2 + y^2 = c$ (b) $x^2 - y^2 = c$ (c) $x^2y^2 = c$ (d) $x^2/y^2 = c$

- (●) a
- ( ) b
- ( ) c
- ( ) d

The solution of the differential equation $y = px + p^2 + p$ is

(a) $y = pc$ (b) $y = cx + c^2 + c$ (c) $y = cx$ (d) $y = pc + c^2 + c$

- (●) a
- ( ) b
- ( ) c
- ( ) d

If e^x is the integrating factor of the differential equation $(x^2+y^2+2x)dx+2ydy=0$, *then the solution is*
(a) $(x^2+y^2)e^x=c$ (b) $(x^2+2y^2)e^x=c$ (c) $(2x^2+y^2)e^x=c$ (d) $(y^2)e^x=c$

- [x] a
- [ ] b
- [ ] c
- [ ] d

if $\frac{1}{2(xy)^2}$ is the integrating factor of the differential equation $(1+xy)ydx+(1-xy)xdy=0$,
Then its solution will be?
(a) $\log\left(\frac{x}{y}\right)-\frac{1}{xy}=c$ (b) $\log\left(\frac{x}{y}\right)+\frac{1}{xy}=c$ (c) $\log\left(\frac{x}{y}\right)-\frac{1}{x}=c$ (d) $\log\left(\frac{x}{y}\right)+\frac{1}{x}=c$

- [x] a
- [ ] b
- [ ] c
- [ ] d

The integrating factor of the differential $(4xy+3y^2-x)dx+(2xy+x^2)dy=0$ *is*
(a) $\frac{1}{(y)^2}$ (b) y^2 (c) $\frac{1}{(x)^2}$ (d) x^2

- [ ] a
- [ ] b
- [ ] c
- [x] d

The solution of the differential equation $(x^2 - y)dx = (x - y^2)dy$ *will be* . ?

(a) $x^3 + y^3 - 3xy = c$ (b) $x^3 + y^3 + 3xy = c$ (c) $x^3 - y^3 - 3xy = c$ (d) $x^3 + y^3 - xy = c$

- (●) a
- ( ) b
- ( ) c
- ( ) d

If the differential equation $16x^2 + 2p^2y - p^3x = 0$ while solving for y takes the form $y = f(x, p)$, then $f(x, p) =$

(a) $\frac{px}{2} - \frac{8x^2}{p^2}$ (b) $\frac{2x}{p} + \frac{8x^2}{p}$ (c) $\frac{x}{2} + \frac{8x^2}{p^2}$ (d) $\frac{8x}{p^2} - \frac{px}{2}$

- (●) a
- ( ) b
- ( ) c
- ( ) d

If the differential equation $y = 3px + 6p^2y^2$ while solving for x takes the form $x = f(y, p)$, then $f(y, p) =$

(a) $\frac{py}{3} - \frac{8y^2}{p^2}$ (b) $\frac{y}{3p} - 2py^2$ (c) $\frac{px}{2} - 2p^2x^2$ (d) $\frac{y}{p^2} - p^2y$

- ( ) a
- (●) b
- ( ) c
- ( ) d

Which of the following is solution of $(p - xy)(p - x^2)(p - y^2) = 0$

(a) $3x - y^3 - c = 0$ (b) $xy + cy + 1 = 0$ (c) $2y + x^2 + c = 0$ (d) None

- ○ a
- ◉ b
- ○ c
- ○ d