1 $(2x-5y+2)dx+(1-6y-5x)dy=0$

$M=2x-5y+2 \qquad N=1-6y-5x$

$\frac{\partial M}{\partial y}=-5 \qquad \frac{\partial N}{\partial x}=-5 \qquad \frac{\partial M}{\partial y}=\frac{\partial N}{\partial x}$

$\frac{\partial F}{\partial x}=2x-5y+2$

$\partial F=2x-5y+2\,dx$

$\int \partial F=\int 2x-5y+2\,dx$

$F=\frac{\cancel{2}x^2}{\cancel{2}}-5yx+2x+f(y)$

$F=x^2-5yx+2x+f(y)$

$\frac{\partial F}{\partial y}=-5x+f(y)'$

$\cancel{-5x}+f(y)'=1-6y\cancel{-5x}$

$f(y)'=1-6y$

$\int f(y)'=\int 1-6y$

$f(y)=y-\frac{6y^2}{2}$

$f(y)=y-3y^2$

$f=x^2-5yx+2x+y-3y^2$

1

$$\boxed{x^2+2x-3y^2+y-5yx=c}$$

$$\left(1-\frac{y}{x^2}e^{y/x}\right)dx+\left(1+\frac{1}{x}e^{y/x}\right)dy=0$$

$$M=1-\frac{y}{x^2}e^{y/x} \qquad N=1+\frac{1}{x}e^{y/x}$$

$$\frac{\partial M}{\partial y}=0-\frac{e^{y/x}y+e^{y/x}x}{x^3}=\frac{-e^{y/x}y+e^{y/x}x}{x^3} \qquad \frac{\partial N}{\partial x}=\frac{\partial N}{\partial y}$$

$$\frac{\partial N}{\partial x}=0-\frac{e^{y/x}y-e^{y/x}x}{x^3}=\frac{-e^{y/x}y+e^{y/x}x}{x^3}$$

$$\frac{\partial F}{\partial x}=1-\frac{y}{x}e^{y/x}\rightarrow \partial F=1-\frac{y}{x}e^{y/x}dx\rightarrow \int df=\int 1-\frac{y}{x}e^{y/x}$$

$$F=x-\left(-e^{y/x}\right)\rightarrow F=x+e^{y/x}+f(y)$$

$$\frac{\partial F}{\partial y}=\frac{e^{y/x}}{x}+f(y)'$$

$$\cancel{\frac{e^{y/x}}{x}}+f(y)'=1+\cancel{\frac{1}{x}e^{y/x}}$$

$$f(y)'=1$$

$$\int f(y)=\int 1$$

$$f(y)=y$$

$$F=x+e^{y/x}+y$$

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$$\boxed{e^{y/x}+y+x=c}$$

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13) $\left(\operatorname{sen} y + \frac{y}{x^2}\operatorname{sen}\frac{y}{x}\right)dx + \left(x\cos y - \frac{1}{x}\operatorname{sen}\frac{y}{x}\right)dy = 0$

$M = \operatorname{sen} y + \frac{y}{x^2}\operatorname{sen} y/x \qquad N = x\cos y - \frac{1}{x}\operatorname{sen} y/x$

$$\frac{\partial M}{\partial y} = \cos y + \frac{x \operatorname{sen} y/x + y\cos y/x}{x^3} \qquad \frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$$

$$\frac{\partial N}{\partial x} = \cos y + \frac{x \operatorname{sen} y/x + y\cos y/x}{x^3}$$

$$\frac{\partial F}{\partial x} = \operatorname{sen} y + \frac{y}{x^2}\operatorname{sen}\frac{y}{x} \Rightarrow dF = \operatorname{sen} y + \frac{y}{x^2}\operatorname{sen} y/x \, \partial x$$

$$\int dF = \int \operatorname{sen} y + \frac{y}{x^2}\operatorname{sen} y/x \, dx \Rightarrow F = \cos y/x + x\operatorname{sen} y + f(y)$$

$$\frac{\partial F}{\partial y} = \frac{-\operatorname{sen} y/x}{x} + x\cos y + f(y)'$$

$$\cancel{\frac{-\operatorname{sen} y/x}{x}} + \cancel{x\cos y} + f(y)' = \cancel{x\cos y} - \cancel{\frac{1}{x}\operatorname{sen} y/x}$$

$$f(y)' = 0 \qquad f(y) = c$$

$$F = \cos^{y/x} + x\operatorname{sen} y + c = C$$

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$$\boxed{x\operatorname{sen} y + \cos\frac{y}{x} = C}$$

$(2x\,\text{sen}\,y + ye^{xy})dx + (x\cos y + e^{xy})dy = 0 \quad y(1) = 1$

$M = 2x\,\text{sen}\,y + ye^{xy} \qquad N = x\cos y + e^{xy}$

$\dfrac{\partial M}{\partial y} = 2x\cos y + e^{xy} + e^{xy}xy \qquad \dfrac{\partial M}{\partial y} \neq \dfrac{\partial N}{\partial x}$

$\dfrac{\partial N}{\partial x} = \cos y + e^{xy}(y + xy)$

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$\boxed{\text{No es exacta}}$ //

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(23) .- $\left(\frac{-1-y^2}{x^2}-1\right)dx + \frac{2y}{x}dy = 0$ $\quad y(1) = 2$

$\frac{1}{x} = x^{-1} \quad -x^{-2} = -\frac{1}{x^2}$

$M = -\frac{1-y^2}{x^2} - 1 \qquad N = \frac{2y}{x}$

$\frac{\partial M}{\partial y} = \frac{-2y}{x^2} \qquad \frac{\partial N}{\partial x} = -\frac{2y}{x^2} \qquad \frac{\partial N}{\partial y} = \frac{\partial N}{\partial x}$

$\frac{\partial F}{\partial y} = \frac{2y}{x} \rightarrow dF = \frac{2y}{x}dy \rightarrow \int dF = \int \frac{2y}{x}dy$

$F = \frac{1}{x}\frac{\cancel{2}y^2}{\cancel{2}} \Rightarrow F = \frac{y^2}{x} + f(x)$

$\frac{\partial F}{\partial x} = -\frac{y^2}{x^2} + f(x)' \rightarrow \cancel{\frac{-y^2}{x^2}} + f(y)' = \frac{-1-\cancel{y^2}}{\cancel{x^2}} - 1$

$f(y)' = -\frac{1}{x^2} - 1 \rightarrow \int f(x)' = \int -\frac{1}{x^2} - 1 \rightarrow f(x) = \frac{1}{x} - x + c$

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

$C = 4$

$\frac{2^2}{1} + \frac{1}{1} - 1 = C \rightarrow 4 + \cancel{1 - 1} = C$

$\frac{y^2}{x} + \frac{1}{x} - x = 4 \rightarrow \frac{y^2}{x} = 4 + x - \frac{1}{x}$

$y^2 = \left(4 + x - \frac{1}{x}\right)x$

$y^2 = 4x + x^2 - \frac{x}{x} \nearrow 1$

$$\boxed{y^2 - x^2 + 1 = 4x}$$

$1 \rightarrow \left(y - \frac{1}{y}\right)dx + \left(x + \frac{x}{y^2}\right)dy = 0 \qquad y^{-1)'} = -y^{-2} = -\frac{1}{y^2}$

$M = y - \frac{1}{y} \qquad N = x + \frac{x}{y^2}$

$y^{-2} = \frac{y^{-1}}{-2}$

$\frac{\partial M}{\partial y} = 1 - \left(-\frac{1}{y^2}\right) = 1 + \frac{1}{y^2} \qquad \frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$

$\frac{\partial N}{\partial x} = x + \frac{x}{y^2} = 1 + \frac{1}{y^2}$

$\frac{\partial F}{\partial x} = y - \frac{1}{y} \rightarrow \partial f = y - \frac{1}{y}\partial x \rightarrow \int df = \int y - \frac{1}{y} \partial x$

$F = yx - \frac{x}{y} + f(y)$

$\frac{\partial f}{\partial y} = x + \frac{x}{y^2} + f(y)' \rightarrow \cancel{x} + \cancel{\frac{x}{y^2}} + f(y)' = \cancel{x} + \cancel{\frac{x}{y^2}}$

$f(y)' = 0 \longrightarrow \int f(y)' = \int 0 \rightarrow F = 0$

$xy - \frac{x}{y} - 0 = c$

$\boxed{xy - \frac{x}{y} = c}$ 31

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