otra resolución que da variables separadas

$$\overset{2}{\cancel{4}} \cancel{\ln a}\, x y a^{2x^2 y} dx + \cancel{2 \ln a}\, x^2 a^{2x^2 y} dy = 0$$

$$2y\,dx + x\,dy = 0$$

$$2y\,dx = -x\,dy$$

$$\int \frac{2}{x}dx = -\int \frac{dy}{y}$$

$$2\ln x = -\ln y + \ln C$$

$$\ln x^2 + \ln y = \ln C$$

$$\ln x^2 y = \ln C$$

$$\boxed{x^2 y = C}$$

<u>Nota</u>: Esta resolución en v.s. valió un suspenso en el examen de febrero 78. No obstante lleva a una solución correcta

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(44) $\operatorname{tg}x\, y' - 2y = 2$

$$y' - \frac{2}{\operatorname{tg}x} y = \frac{2}{\operatorname{tg}x}$$

1º) $\displaystyle\int -\frac{2}{\operatorname{tg}x}dx = -2\int \frac{1}{\operatorname{tg}x}dx = -2\int \frac{\cos x}{\operatorname{sen}x}dx$

$$= -2 \ln \operatorname{sen}x = \ln(\operatorname{sen}x)^{-2}$$

2°) $e^{\ln(\operatorname{sen} x)^{-2}} = (\operatorname{sen} x)^{-2} = \dfrac{1}{\operatorname{sen}^2 x}$

3°) $\displaystyle\int \frac{1}{\operatorname{sen}^2 x} \cdot \frac{2}{\operatorname{sen} x} \cos x \, dx = 2\int \frac{\cos x}{\operatorname{sen}^3 x} = 2\int (\operatorname{sen} x)^{-3} \cos x \, dx$

$= \dfrac{2(\operatorname{sen} x)^{-2}}{-2} = -(\operatorname{sen} x)^{-2}$

$$\frac{y}{\operatorname{sen}^2 x} = -\frac{1}{(\operatorname{sen} x)^2} + C$$

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45

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

1) $\displaystyle\int -\frac{2}{x+1} \, dx = -2\int \frac{1}{x+1} = -2\ln|x+1|$

2) $e^{-2\ln(x+1)} = e^{\ln(x+1)^{-2}} = (x+1)^{-2} = \dfrac{1}{(x+1)^2}$

3) $\displaystyle\int (x+1)^{-2} \cdot (x+1)^2 \, dx = \int dx = x$

$$(x+1)^{-2} y = x + C$$

$$\frac{dy}{dx} - \frac{y}{x} = x$$

1°) $\int -\frac{1}{x}\,dx = -\int \frac{1}{x}\,dx = -\ln|x|$

2°) $e^{-\ln x} = e^{\ln x^{-1}} = \frac{1}{x}$

3°) $\int \frac{1}{x}\cdot x\,dx = \int dx = x$

$$\frac{1}{x}\,y = x + C$$

$$y = x^2 + xC = x\,(x + C)$$

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(47) $y' = \frac{4}{x} + x\sqrt{y}$

$y' - \frac{4}{x}\,y = x\,y^{\frac{1}{2}}$ Bernoulli

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

$y' = 2u\cdot u'$

$2u\cdot u' - \frac{4}{x}u^2 = x\,u$

$u' - \frac{2}{x}\,u = \frac{x}{2}$ lineal 1er orden en $u$