

ECUACIONES DIFERENCIALES

Primer Examen

Profesor: Ing. Gabriel Zapata

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Paralelo: 10444

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Resultado Obtenido:

Resolver la siguiente ecuación

(2 ptos)

$$y' = y^{\frac{1}{3}} \left(x - y^{\frac{2}{3}} \right)$$

$$y' = \chi y^{\frac{1}{3}} - y^{\frac{2}{3}}$$

$$y' - \chi y^{\frac{1}{3}} = -y^{\frac{2}{3}}$$

$$\frac{\partial x}{\partial \beta} - x \beta_{\frac{3}{2}} = -\lambda_{\frac{3}{2}},$$

$$\frac{dy}{dx} - xy^{\frac{1}{3}} = -y^{\frac{3}{3}}$$

$$\frac{dy}{dx} - xy^{\frac{1}{3}} = -y(x).$$

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$$(xy^{\frac{1}{3}} - y)dx - dy = 0$$

$$F(x) = x \cdot x^{\frac{1}{3}} = 1.$$

$$\mu(x) = e^{\int x} = e^{\frac{x^2}{2}}$$

$$y = \frac{1}{e^{\frac{x^2}{2}}} \cdot \int e^{\frac{x^2}{2}} \cdot 1 \, dx$$

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$$Sen_{5}qn$$

$$3n = 9x$$

$$9n = \frac{1}{7}9x$$

- Busco que Forma lineal. Liene

$$\frac{dy}{dy} = \chi y^{\frac{1}{3}} - y$$

tenson como exacta?

Trato de resolver como Bernoulli

$$\frac{\partial x}{\partial a} - x \lambda_{\frac{3}{2}} = -\lambda_{v,\tau}$$

$$Con M = T$$

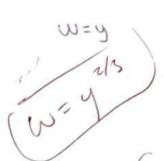
$$\frac{\partial x}{\partial n} + \frac{3}{5}m = -\frac{3}{5}x$$

$$\frac{\partial x}{\partial n} + (1 - \frac{7}{7})m = x(1 - \frac{7}{7})$$

$$\frac{\partial x}{\partial n} + 0 = x n \frac{3}{7}$$

$$\frac{\partial x}{\partial n} + 0 = \frac{3}{7}x$$

$$\frac{d\omega}{d\omega} = \frac{2}{3}(\omega - x)$$



 $(x\cos t + 2te^x)dt + (\sin t + t^2e^x + 2)dx = 0$

Para comodidad cambio de variable t=y

(xcosy + zyex) dy + (siny + y2ex + z) dx =0.

No es homogenea, así que venticol si/os exacta, escribiento en.

La Forma Midx + Ndy =0.

- Condición de compatibilizad.

dM= (cosy + 2yex +0) Se observa que tanto dM = dN : La ecua.

DN = (cosy + 2yex)] ción es una [EDO EXACTA]

- Criterio de exactitud

3F = M. = Siny +y2ex + 2.

2F = N = xcosy + lyex Q

i-r recomplaza en 6

3 (xsiny + exy2+2x+. g(4)) = N.

xcosg + lyex + 0 + do = xcosg +2gex.

 $\frac{\partial \phi}{\partial x} = 0$.

ldg = 10.dy

q = 0

F de 0

18 = 461

F = [(siny + y2ex +2) dx

E=2.48 gx + B f ext 5 gx

5 = xsiny + . 2xy + 2x + . g(y)

sol. F: xsiny + exp2+2x + G

3. Determinar las trayectorias isogonales a 45° a la familia de curvas: $y = -x - 1 + Ce^x$ Angulo.

Formula isogonales
$$\frac{\partial y}{\partial x} = \frac{f(xy) - tg\theta}{1 + f(x,y) tg\theta} \qquad \frac{Angula}{tg\theta = 1}$$

$$y' = -x - 1 + Ce^x$$
. Derivo para encontrar y'
 $y' = -1 - 0 + Ce^x$.

(3 ptos)

①
$$y = -x - t + ce^{x}$$
. (multiplico por -1):

$$\frac{dy}{dx} = \frac{x+y-tgo^{\frac{1}{2}}}{1+(x+y)tgo^{\frac{1}{2}}} \Rightarrow \frac{dy}{dx} = \frac{x+x+1}{1+x+y} \cdot (multiplico \quad ambos)$$

$$(multiplico \quad ambos)$$

$$(multiplico \quad ambos)$$

$$(ados \cdot (x+y+1))$$

$$\Rightarrow$$
 (L+X+y)dy = (X+y)dx.

PReselvo como exacta.

$$\frac{\partial M}{\partial y} = 1$$
 Comple la
$$\frac{\partial F}{\partial x} = N = x + y - 1 \text{ (a)}$$
 Signo
$$\frac{\partial N}{\partial x} = 1$$
 Compatibilidad.
$$\frac{\partial F}{\partial y} = N = 1 + x + y \text{ (a)}$$

$$F: \int_{X} x \, dx + \lambda \int_{Y} (3x - 1) dx$$

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$$S = A + \frac{\pi}{3}$$

$$0 + x + \frac{9a}{3a} = 1 + x$$

$$19a = 1 +$$