

EDs

- Separable
- Lineal
- Exactas.
- Homogéneas.

Corta

A. 1 pregunta 20 mins

B. 2 preguntas 40 mins.

Corta 3 Exacta y Homogénea.

Ejercicios: Resuelva.

a. $(4y + 2t - 5)dt + (6y + 4t - 1)dy = 0$; $y(1) = 2$

b. $(\sin\theta - 2r\cos^2\theta + 2r)dr + (2r^2\cos\theta\sin\theta + r\cos\theta + \sin\theta)d\theta = 0$

c. $\frac{dy}{dt} + 2y = 40e^{-2t}\sin(2t)$

ED exacta $M(y, t) = 4y + 2t - 5$

$N(y, t) = 6y + 4t - 1$

$$\frac{\partial M}{\partial y} = 4$$

$$\frac{\partial N}{\partial t} = 4 \quad \text{exacta}$$

Resuelva. (1) $\frac{\partial F}{\partial t} = 4y + 2t - 5$

(2) $\frac{\partial F}{\partial y} = 6y + 4t - 1$

Integre (1) $F = 4yt + t^2 - 5t + C(y)$ (3)

Derive (3) $\frac{\partial F}{\partial y} = \cancel{4t} + C'(y) = 6y + \cancel{4t} - 1$

Integre: $C'(y) = 6y - 1 \Rightarrow C(y) = 3y^2 - y$

Soln General: $4yt + t^2 - 5t + 3y^2 - y = C.$

¿Cómo se encuentra C? use $y(1) = 2.$

$$8(1) + 1 - 5 + 3(4) - 2 = C.$$

$$9 - 5 + 10 = 14 = C$$

Soln Particular: $3y^2 - y + 4yt + t^2 - 5t = 14$

Comentario: Tarea 2 Problema 1:

$$y^2 + (4)y = \sin(x + x^2) + C,$$

Complete al cuadrado: $\left(\frac{4}{2}\right)^2 = 4$

$$y^2 + 4y + 4 = \sin(x + x^2) + C + 4$$

$$(y + 2)^2 = \sin(x + x^2) + C + 4$$

$$y = -2 + \sqrt{\sin(x + x^2) + C + 4}$$

Fórmula
cuadrática.

$$y = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$a = 1$$

$$b = 4$$

$$C = -\sin(x + x^2) - 4$$