

$$\begin{aligned}
& \text{restart} \\
& \text{Ecuacion} := 2 \cdot y(x) \cdot (y'(x) + 2) - x \cdot (y'(x)) \cdot 2 = 0 \\
& \text{Ecuacion} := 2 y(x) \left(\frac{d}{dx} y(x) + 2 \right) - x \left(\frac{d}{dx} y(x) \right)^2 = 0 \quad (1) \\
& \text{Solucion} := \text{dsolve}(\text{Ecuacion}) \\
& \text{Solucion} := y(x) = 0, y(x) = -4 x, y(x) = \frac{1}{2} \frac{x (-x + 2 - CI)^2}{-CI^2 \left(-\frac{-x + 2 - CI}{-CI} + 2 \right)} \quad (2) \\
& \text{Solucion}_1 \\
& y(x) = 0 \quad (3) \\
& \text{Solucion}_2 \\
& y(x) = -4 x \quad (4) \\
& \text{SolucionGeneral} := \text{subs} \left(-CI = \frac{C_1}{2}, \text{simplify}(\text{Solucion}_3) \right) \\
& \text{SolucionGeneral} := y(x) = \frac{(-x + C_1)^2}{C_1} \quad (5) \\
& \text{SolucionParticular}_1 := \text{subs}(C_1 = 1, \text{SolucionGeneral}) \\
& \text{SolucionParticular}_1 := y(x) = (-x + 1)^2 \quad (6) \\
& \text{SolucionParticular}_2 := \text{subs}(C_1 = -4, \text{SolucionGeneral}) \\
& \text{SolucionParticular}_2 := y(x) = -\frac{1}{4} (-x - 4)^2 \quad (7) \\
& \text{SolucionSingular}_1 := \text{Solucion}_2 \\
& \text{SolucionSingular}_1 := y(x) = -4 x \quad (8) \\
& \text{Comprobacion}_0 := \text{simplify}(\text{eval}(\text{subs}(y(x) = \text{rhs}(\text{SolucionGeneral}), \text{Ecuacion}))) \\
& \text{Comprobacion}_0 := 0 = 0 \quad (9) \\
& \text{Comprobacion}_1 := \text{simplify}(\text{eval}(\text{subs}(y(x) = \text{rhs}(\text{SolucionParticular}_1), \text{Ecuacion}))) \\
& \text{Comprobacion}_1 := 0 = 0 \quad (10) \\
& \text{Comprobacion}_2 := \text{simplify}(\text{eval}(\text{subs}(y(x) = \text{rhs}(\text{SolucionParticular}_2), \text{Ecuacion}))) \\
& \text{Comprobacion}_2 := 0 = 0 \quad (11) \\
& \text{Comprobacion}_3 := \text{simplify}(\text{eval}(\text{subs}(y(x) = \text{rhs}(\text{SolucionSingular}_1), \text{Ecuacion}))) \\
& \text{Comprobacion}_3 := 0 = 0 \quad (12) \\
& \text{EcuacionParametrica}_1 := \text{rhs}(\text{SolucionParticular}_1) = \text{rhs}(\text{SolucionGeneral}) \\
& \text{EcuacionParametrica}_1 := (-x + 1)^2 = \frac{(-x + C_1)^2}{C_1} \quad (13) \\
& \text{Parametro}_1 := \text{solve}(\text{EcuacionParametrica}_1, C_1) \\
& \text{Parametro}_1 := 1, x^2 \quad (14) \\
& \text{EcuacionParametrica}_2 := \text{rhs}(\text{SolucionParticular}_2) = \text{rhs}(\text{SolucionGeneral})
\end{aligned}$$

$$EcuacionParametrica_2 := -\frac{1}{4} (-x-4)^2 = \frac{(-x+C_1)^2}{C_1} \quad (15)$$

> Parametro₂ := solve(EcuacionParametrica₂, C₁)

$$Parametro_2 := -4, -\frac{1}{4} x^2 \quad (16)$$

> EcuacionParametrica₃ := rhs(SolucionSingular₁) = rhs(SolucionGeneral)

$$EcuacionParametrica_3 := -4x = \frac{(-x+C_1)^2}{C_1} \quad (17)$$

> Parametro₃ := solve(EcuacionParametrica₃, C₁)

$$Parametro_3 := -x, -x \quad (18)$$

> restart

> Ecuacion := y''(x) + 9·y(x) = 0

$$Ecuacion := \frac{d^2}{dx^2} y(x) + 9 y(x) = 0 \quad (19)$$

Clasificación = E. D. O. (2) L. c.c. H.

> SolucionGeneral := dsolve(Ecuacion)

$$SolucionGeneral := y(x) = _C1 \sin(3x) + _C2 \cos(3x) \quad (20)$$

> plot([rhs(subs(_C1 = 1, _C2 = 2, SolucionGeneral)), rhs(subs(_C1 = 1, _C2 = 2, SolucionGeneral)), rhs(subs(_C1 = 1, _C2 = 3, SolucionGeneral)), rhs(subs(_C1 = 1, _C2 = 4, SolucionGeneral)), rhs(subs(_C1 = 2, _C2 = 2, SolucionGeneral)), rhs(subs(_C1 = 2, _C2 = 3, SolucionGeneral)), rhs(subs(_C1 = 2, _C2 = 4, SolucionGeneral)), rhs(subs(_C1 = 3, _C2 = 2, SolucionGeneral))], x = -1 .. 1)

