

> restart

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$$178. x \ln x \cdot y' - y = x^3 (3 \ln x - 1).$$

> Ecuacion := $y'(x) - \frac{y(x)}{x \cdot \log(x)} = \text{expand}\left(\frac{x \cdot 3 \cdot (3 \cdot \log(x) - 1)}{x \cdot \log(x)}\right)$

$$Ecuacion := \frac{d}{dx} y(x) - \frac{y(x)}{x \ln(x)} = 3x^2 - \frac{x^2}{\ln(x)} \quad (1)$$

> $p := \frac{-1}{x \cdot \log(x)}$

$$p := -\frac{1}{x \ln(x)} \quad (2)$$

> $q := \text{rhs}(Ecuacion)$

$$q := 3x^2 - \frac{x^2}{\ln(x)} \quad (3)$$

> $IntPosP := \text{int}(p, x)$

$$IntPosP := -\ln(\ln(x)) \quad (4)$$

> $IntNegP := -\text{int}(p, x)$

$$IntNegP := \ln(\ln(x)) \quad (5)$$

> $SolPart := \exp(IntNegP) \cdot \text{int}(\exp(IntPosP) \cdot q, x)$

$$SolPart := x^3 \quad (6)$$

> $SolucionGeneral := y(x) = C_1 \cdot \exp(IntNegP) + SolPart$

$$SolucionGeneral := y(x) = C_1 \ln(x) + x^3 \quad (7)$$

> $SolGral := \text{dsolve}(Ecuacion)$

$$SolGral := y(x) = x^3 + \ln(x) _C1 \quad (8)$$

> restart

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$$182. y' = \frac{1}{x \sin y + 2 \sin 2y}.$$

> Ecuacion := $y'(x) = \frac{1}{x \cdot \sin(y(x)) + 2 \cdot \sin(2 \cdot y(x))}$

$$Ecuacion := \frac{d}{dx} y(x) = \frac{1}{x \sin(y(x)) + 2 \sin(2 y(x))} \quad (9)$$

> EcuacionLineal := $\text{diff}(x(y), y) = x(y) \cdot \sin(y) + 2 \cdot \sin(2 \cdot y)$

$$EcuacionLineal := \frac{d}{dy} x(y) = x(y) \sin(y) + 2 \sin(2 y) \quad (10)$$

> $p := -\sin(y); q := 2 \cdot \sin(2 \cdot y)$

$$p := -\sin(y)$$

$$q := 2 \sin(2 y) \quad (11)$$

$$\begin{aligned} &> \text{IntPosP} := \text{int}(p, y) \\ &\qquad\qquad\qquad \text{IntPosP} := \cos(y) \end{aligned} \tag{12}$$

$$\begin{aligned} &> \text{IntNegP} := -\text{int}(p, y) \\ &\qquad\qquad\qquad \text{IntNegP} := -\cos(y) \end{aligned} \tag{13}$$

$$\begin{aligned} &> \text{SolPart} := \text{expand}(\exp(\text{IntNegP}) \cdot \text{int}(\exp(\text{IntPosP}) \cdot q, y)) \\ &\qquad\qquad\qquad \text{SolPart} := -4 \cos(y) + 4 \end{aligned} \tag{14}$$

$$\begin{aligned} &> \text{SolGral} := x(y) = C_1 \cdot \exp(\text{IntNegP}) + \text{SolPart} \\ &\qquad\qquad\qquad \text{SolGral} := x(y) = C_1 e^{-\cos(y)} - 4 \cos(y) + 4 \end{aligned} \tag{15}$$

$$\begin{aligned} &> \text{Parametro} := \text{expand}(\text{isolate}(\text{SolGral}, C_1)) \\ &\qquad\qquad\qquad \text{Parametro} := C_1 = e^{\cos(y)} x(y) + 4 e^{\cos(y)} \cos(y) - 4 e^{\cos(y)} \end{aligned} \tag{16}$$

$$\begin{aligned} &> \text{Solucion} := e^{\cos(y(x))} x + 4 e^{\cos(y(x))} \cos(y(x)) - 4 e^{\cos(y(x))} = C_1 \\ &\qquad\qquad\qquad \text{Solucion} := e^{\cos(y(x))} x + 4 e^{\cos(y(x))} \cos(y(x)) - 4 e^{\cos(y(x))} = C_1 \end{aligned} \tag{17}$$

$$\begin{aligned} &> \text{DerivadaFinal} := \text{simplify}(\text{isolate}(\text{diff}(\text{Solucion}, x), \text{diff}(y(x), x))) \\ &\qquad\qquad\qquad \text{DerivadaFinal} := \frac{d}{dx} y(x) = \frac{1}{\sin(y(x)) (x + 4 \cos(y(x)))} \end{aligned} \tag{18}$$

$$\begin{aligned} &> \text{Ecuacion} \\ &\qquad\qquad\qquad \frac{d}{dx} y(x) = \frac{1}{x \sin(y(x)) + 2 \sin(2 y(x))} \end{aligned} \tag{19}$$

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