

> restart		
> Ecua := y' + 2·x·y = 2·x·exp(-x ²)		
	$Ecua := \frac{d}{dx} y(x) + 2 x y(x) = 2 x e^{-x^2}$	(1)
> p := 2·x		
	$p := 2 x$	(2)
> q := rhs(Ecua)		
	$q := 2 x e^{-x^2}$	(3)
> EcuaHom := lhs(Ecua) = 0		
	$EcuaHom := \frac{d}{dx} y(x) + 2 x y(x) = 0$	(4)
> SolHom := _C1·exp(-int(p, x))		
	$SolHom := _C1 e^{-x^2}$	(5)
> SolPartQ := exp(-int(p, x))·int(exp(int(p, x))·q, x)		
	$SolPartQ := e^{-x^2} x^2$	(6)
> SolGral := y(x) = SolHom + SolPartQ		
	$SolGral := y(x) = _C1 e^{-x^2} + e^{-x^2} x^2$	(7)
> Ecua		
	$\frac{d}{dx} y(x) + 2 x y(x) = 2 x e^{-x^2}$	(8)
> restart		
> Ecua := y' = (x - 4·y - 1) ²		
	$Ecua := \frac{d}{dx} y(x) = (x - 4 y(x) - 1)^2$	(9)
> CondIni := y(0) = 0		
	$CondIni := y(0) = 0$	(10)
> EcuaEcua := eval(subs(isolate(z(x) = x - 4·y(x) - 1, y(x)), Ecua))		
	$EcuaEcua := -\frac{\frac{d}{dx} z(x)}{4} + \frac{1}{4} = z(x)^2$	(11)
> EcuaDos := isolate(EcuaEcua, diff(z(x), x))		
	$EcuaDos := \frac{d}{dx} z(x) = -4 z(x)^2 + 1$	(12)
> with(DEtools) :		
> odeadvisor(EcuaDos)		
	$[_{quadrature}]$	(13)
> intfactor(EcuaDos)		
	$\frac{1}{(2 z(x) - 1) (2 z(x) + 1)}$	(14)

$$\begin{aligned} &> FI := \text{simplify}\left(\frac{1}{(2z-1)(2z+1)}\right) \\ &FI := \frac{1}{4z^2-1} \end{aligned} \quad (15)$$

$$\begin{aligned} &> M := 4z^2 - 1 \\ &M := 4z^2 - 1 \end{aligned} \quad (16)$$

$$\begin{aligned} &> N := 1 \\ &N := 1 \end{aligned} \quad (17)$$

$$\begin{aligned} &> MM := M \cdot FI \\ &MM := 1 \end{aligned} \quad (18)$$

$$\begin{aligned} &> NN := N \cdot FI \\ &NN := \frac{1}{4z^2-1} \end{aligned} \quad (19)$$

$$\begin{aligned} &> P := 1; Q := 1; R := 1; S := \frac{1}{4z^2-1} \\ &P := 1 \\ &Q := 1 \\ &R := 1 \\ &S := \frac{1}{4z^2-1} \end{aligned} \quad (20)$$

$$\begin{aligned} &> SolGral := \text{simplify}\left(\text{int}\left(\frac{P}{R}, x\right) + \text{int}\left(\frac{S}{Q}, z\right)\right) = _CI \\ &SolGral := x - \frac{\ln(2z+1)}{4} + \frac{\ln(2z-1)}{4} = _CI \end{aligned} \quad (21)$$

$$\begin{aligned} &> \text{subs}(x=0, y(0)=0, z(x)=x-4 \cdot y(x)-1) \\ &z(0) = -1 \end{aligned} \quad (22)$$

$$\begin{aligned} &> Para := \text{simplify}(\text{subs}(x=0, z=-1, SolGral)) \\ &Para := \frac{\ln(3)}{4} = _CI \end{aligned} \quad (23)$$

$$\begin{aligned} &> SolPartDos := \text{subs}(_CI = \text{lhs}(Para), SolGral) \\ &SolPartDos := x - \frac{\ln(2z+1)}{4} + \frac{\ln(2z-1)}{4} = \frac{\ln(3)}{4} \end{aligned} \quad (24)$$

$$\begin{aligned} &> SolPartFinal := \text{simplify}(\text{isolate}(\text{simplify}(\text{subs}(z=x-4 \cdot y(x)-1, SolPartDos)), y(x))) \\ &SolPartFinal := y(x) = \frac{(2x-3)e^{4x}-6x+3}{8e^{4x}-24} \end{aligned} \quad (25)$$

$$\begin{aligned} &> Ecua \\ &\frac{d}{dx} y(x) = (x-4y(x)-1)^2 \end{aligned} \quad (26)$$

$$\begin{aligned} &> \text{ComprobarDos} := \text{simplify}(\text{eval}(\text{subs}(y(x) = \text{rhs}(SolPartFinal), \text{lhs}(Ecua) - \text{rhs}(Ecua) \\ &= 0))) \end{aligned}$$

$$ComprobarDos := 0 = 0 \quad (27)$$

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> restart

$$\begin{aligned} & \triangleright \textit{Ecua} := \textit{diff}(x(y), y) - \cos(y) \cdot x(y) = \sin(2 \cdot y) \\ & \textit{Ecua} := \frac{\text{d}}{\text{d}y} x(y) - \cos(y) x(y) = \sin(2 y) \end{aligned} \quad (28)$$

$$\begin{aligned} & \color{red}{p} := -\cos(y) \\ & \color{blue}{p} := -\cos(y) \end{aligned} \tag{29}$$

$$\begin{aligned} & \triangleright q := rhs(Ecua) \\ & \quad q := \sin(2y) \end{aligned} \tag{30}$$

$$\begin{aligned} & \triangleright \text{SolHom} := _Cl \cdot \exp(-\text{int}(p, y)) \\ & \text{SolHom} := _Cl e^{\sin(y)} \end{aligned} \quad (31)$$

$$\begin{aligned} & \textcolor{red}{>} \textit{SolPart} := \textit{simplify}(\exp(-\textit{int}(p, y)) \cdot \textit{int}(\exp(\textit{int}(p, y)) \cdot q, y)) \\ & \textcolor{blue}{\textit{SolPart} := -2 \sin(y) - 2} \end{aligned} \quad (32)$$

$$\begin{aligned} & \triangleright \textit{SolGral} := x(y) = \textit{SolHom} + \textit{SolPart} \\ & \textit{SolGral} := x(y) = _CI \, e^{\sin(y)} - 2 \sin(y) - 2 \end{aligned} \quad (33)$$

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