> restart

> $Ecua := diff(y(x), x) - 3 \cdot y(x) = -24 \cdot x^2 + 16 \cdot x$

$$Ecua := \frac{d}{dx} y(x) - 3 y(x) = -24 x^2 + 16 x \tag{1}$$

> $SolGral := dsolve(Ecua)$

$$SolGral := y(x) = 8 x^2 + e^{3x} \_C1 \tag{2}$$

> restart

> $Ecua := y' + 2 \cdot x \cdot y = 2 \cdot x \cdot \exp(-x^2)$

$$Ecua := \frac{d}{dx} y(x) + 2 x y(x) = 2 x e^{-x^2} \tag{3}$$

> $p := 2 x$

$$p := 2 x \tag{4}$$

> $q := rhs(Ecua)$

$$q := 2 x e^{-x^2} \tag{5}$$

> $EcuaHom := lhs(Ecua)$

$$EcuaHom := \frac{d}{dx} y(x) + 2 x y(x) \tag{6}$$

> $with(DEtools):$
> $FI := intfactor(EcuaHom)$

$$FI := e^{x^2} \tag{7}$$

> $FInt := \exp(int(p, x))$

$$FInt := e^{x^2} \tag{8}$$

> $SolGral := y(x) = \dfrac{\_C1}{FI} + \dfrac{int(FI \cdot q, x)}{FI}$

$$SolGral := y(x) = \frac{\_C1}{e^{x^2}} + \frac{x^2}{e^{x^2}} \tag{9}$$

> restart

> $Ecuacion := diff(y(x), x) = \dfrac{1}{x \cdot \cos(y(x)) + \sin(2 \cdot y(x))}$

$$Ecuacion := \frac{d}{dx} y(x) = \frac{1}{x \cos(y(x)) + \sin(2 y(x))} \tag{10}$$

> $with(DEtools):$
> $odeadvisor(Ecuacion)$

$$[[\_1st\_order, \_with\_symmetry\_[F(x)*G(y),0]]] \tag{11}$$

>

> $EcuaDos := diff(x(y), y) = x(y) \cdot \cos(y) + \sin(2 \cdot y)$

$$EcuaDos := \frac{d}{dy} x(y) = x(y) \cos(y) + \sin(2 y) \tag{12}$$

> $EcuaTres := lhs(EcuaDos) - x(y) \cdot \cos(y) = rhs(EcuaDos) - x(y) \cdot \cos(y)$

$$EcuaTres := \frac{d}{dy} x(y) - x(y) \cos(y) = \sin(2 y) \tag{13}$$

> $p := -\cos(y)$

$$p := -\cos(y) \tag{14}$$

> $q := \sin(2\,y)$

$$q := \sin(2\,y) \tag{15}$$

> $FI := \exp(int(p, y))$

$$FI := e^{-\sin(y)} \tag{16}$$

> $SolGral := x(y) = expand\left(simplify\left(\dfrac{C1}{FI} + \dfrac{int(FI \cdot q, y)}{FI} \right) \right)$

$$SolGral := x(y) = -2\,\sin(y) - 2 + e^{\sin(y)}\,\_C1 \tag{17}$$

> $restart$

> $Ecua := x \cdot \log(x) \cdot y' - y = x^3 \cdot (3 \cdot \log(x) - 1)$

$$Ecua := x\,\ln(x)\left(\dfrac{\mathrm{d}}{\mathrm{d}x}\,y(x) \right) - y(x) = x^3\,(3\,\ln(x) - 1) \tag{18}$$

> $EcuaDos := expand\left(\dfrac{lhs(Ecua)}{x \cdot \log(x)} = \dfrac{rhs(Ecua)}{x \cdot \log(x)} \right)$

$$EcuaDos := \dfrac{\mathrm{d}}{\mathrm{d}x}\,y(x) - \dfrac{y(x)}{x\,\ln(x)} = 3\,x^2 - \dfrac{x^2}{\ln(x)} \tag{19}$$

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

$$p := -\dfrac{1}{x\,\ln(x)} \tag{20}$$

> $q := rhs(EcuaDos)$

$$q := 3\,x^2 - \dfrac{x^2}{\ln(x)} \tag{21}$$

> $FI := \exp(int(p, x))$

$$FI := \dfrac{1}{\ln(x)} \tag{22}$$

> $SolGral := \dfrac{C1}{FI} + \dfrac{int(FI \cdot q, x)}{FI}$

$$SolGral := \_C1\,\ln(x) + x^3 \tag{23}$$

>
>
>
>