> restart

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

$$Ecua := x \ln(x) \left(\frac{d}{dx} y(x) \right) - y(x) = x^3 (3 \ln(x) - 1) \tag{1}$$

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

$$EcuaDos := \frac{d}{dx} y(x) - \frac{y(x)}{x \ln(x)} = 3 x^2 - \frac{x^2}{\ln(x)} \tag{2}$$

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

$$p := -\frac{1}{x \ln(x)} \tag{3}$$

> $q := rhs(EcuaDos)$

$$q := 3 x^2 - \frac{x^2}{\ln(x)} \tag{4}$$

> $IntPx := int(p, x)$

$$IntPx := -\ln(\ln(x)) \tag{5}$$

> $IntPxNeg := -int(p, x)$

$$IntPxNeg := \ln(\ln(x)) \tag{6}$$

> $ExpIntPx := \exp(IntPx)$

$$ExpIntPx := \frac{1}{\ln(x)} \tag{7}$$

> $ExpIntPxNeg := \exp((IntPxNeg))$

$$ExpIntPxNeg := \ln(x) \tag{8}$$

> $ProdExpIntPx := expand(ExpIntPx \cdot q)$

$$ProdExpIntPx := \frac{3 x^2}{\ln(x)} - \frac{x^2}{\ln(x)^2} \tag{9}$$

> $IntProdExp := int(ProdExpIntPx, x)$

$$IntProdExp := \frac{x^3}{\ln(x)} \tag{10}$$

> $SolPartQ := y(x) = \exp(IntPxNeg) \cdot int(\exp(IntPx) \cdot q, x)$

$$SolPartQ := y(x) = x^3 \tag{11}$$

> $SolGralHom := y(x) = \_C1 \cdot \exp(-IntPx)$

$$SolGralHom := y(x) = \_C1 \ln(x) \tag{12}$$

> $SolGralNoHom := y(x) = rhs(SolGralHom) + rhs(SolPartQ)$

$$SolGralNoHom := y(x) = \_C1 \ln(x) + x^3 \tag{13}$$

> restart

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

$$Ecua := \frac{d}{dy} x(y) = \cos(y) x(y) + \sin(2 y) \tag{14}$$

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

$$EcuaDos := \frac{d}{dy} x(y) - \cos(y) x(y) = \sin(2 y) \tag{15}$$

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

$$p := -\cos(y)$$
$$q := \sin(2 y) \tag{16}$$

> $IntPy := int(p, y)$

$$IntPy := -\sin(y) \tag{17}$$

> $SolGralHom := x(y) = \_C1 \cdot \exp(-IntPy)$

$$SolGralHom := x(y) = \_C1\, e^{\sin(y)} \tag{18}$$

> $SolPartQ := x(y) = expand(\exp(-IntPy) \cdot int(\exp(IntPy) \cdot q, y))$

$$SolPartQ := x(y) = -2 \sin(y) - 2 \tag{19}$$

> $SolGralNoHom := x(y) = rhs(SolGralHom) + rhs(SolPartQ)$

$$SolGralNoHom := x(y) = \_C1\, e^{\sin(y)} - 2 \sin(y) - 2 \tag{20}$$

> $EcuaOrig := y' = \dfrac{1}{x \cdot \cos(y) + \sin(2 \cdot y)}$

$$EcuaOrig := \frac{d}{dx} y(x) = \frac{1}{x \cos(y(x)) + \sin(2 y(x))} \tag{21}$$

> $SolOrig := x = \_C1 \cdot \exp(\sin(y(x))) - 2 \cdot \sin(y(x)) - 2$

$$SolOrig := x = \_C1\, e^{\sin(y(x))} - 2 \sin(y(x)) - 2 \tag{22}$$

> $DerSolOrigX := isolate(diff(SolOrig, x), diff(y(x), x))$

$$DerSolOrigX := \frac{d}{dx} y(x) = -\frac{1}{-\_C1 \cos(y(x))\, e^{\sin(y(x))} + 2 \cos(y(x))} \tag{23}$$

> $Para := isolate(SolOrig, \_C1)$

$$Para := \_C1 = -\frac{-x - 2 \sin(y(x)) - 2}{e^{\sin(y(x))}} \tag{24}$$

> $DerOrigDos := simplify(subs(\_C1 = rhs(Para), DerSolOrigX))$

$$DerOrigDos := \frac{d}{dx} y(x) = \frac{\sec(y(x))}{x + 2 \sin(y(x))} \tag{25}$$

> $Comprobar := simplify(rhs(EcuaOrig) - rhs(DerOrigDos)) = 0$

$$Comprobar := 0 = 0 \tag{26}$$

>
>
>