> **restart**

>

$$\left(3x^2y^2 + 2xy^4 + y^5\right) + \left(2x^3y + 4x^2y^3 + 5xy^4\right) \cdot \frac{dy}{dx} = 0$$

> $Ecuacion := 3 \cdot x \cdot\cdot 2 \cdot y(x) \cdot\cdot 2 + 2 \cdot x \cdot y(x) \cdot\cdot 4 + y(x) \cdot\cdot 5 + (2 \cdot x \cdot\cdot 3 \cdot y(x) + 4 \cdot x \cdot\cdot 2 \cdot y(x) \cdot\cdot 3 + 5$
$\cdot x \cdot y(x) \cdot\cdot 4) \cdot diff(y(x), x) = 0$

$Ecuacion := 3\,x^2\,y(x)^2 + 2\,x\,y(x)^4 + y(x)^5 + \left(2\,x^3\,y(x) + 4\,x^2\,y(x)^3 + 5\,x\,y(x)^4\right)\left(\frac{d}{dx}\,y(x)\right)$ **(1)**

$= 0$

> $with(DEtools):$

> $odeadvisor(Ecuacion)$

$$[\_exact, \_rational, \_dAlembert] \tag{2}$$

> $M(x, y) := 3 \cdot x \cdot\cdot 2 \cdot y \cdot\cdot 2 + 2 \cdot x \cdot y \cdot\cdot 4 + y \cdot\cdot 5$

$$M(x, y) := 3\,x^2\,y^2 + 2\,x\,y^4 + y^5 \tag{3}$$

> $N(x, y) := 2 \cdot x \cdot\cdot 3 \cdot y + 4 \cdot x \cdot\cdot 2 \cdot y \cdot\cdot 3 + 5 \cdot x \cdot y \cdot\cdot 4$

$$N(x, y) := 2\,x^3\,y + 4\,x^2\,y^3 + 5\,x\,y^4 \tag{4}$$

> $comprobacion_1 := simplify(diff(M(x, y), y) - diff(N(x, y), x)) = 0$

$$comprobacion_1 := 0 = 0 \tag{5}$$

> $SolucionGeneral_1 := int(M(x, y), x) + int((N(x, y) - diff(int(M(x, y), x), y)), y) = C1$

$$SolucionGeneral_1 := x^3\,y^2 + x^2\,y^4 + y^5\,x = C1 \tag{6}$$

> $SolucionGeneral_2 := int(N(x, y), y) + int((M(x, y) - diff(int(N(x, y), y), x)), x) = C1;$

$$SolucionGeneral_2 := x^3\,y^2 + x^2\,y^4 + y^5\,x = C1 \tag{7}$$

> $SOLUCION := x^3\,y(x)^2 + x^2\,y(x)^4 + y(x)^5\,x = C1$

$$SOLUCION := x^3\,y(x)^2 + x^2\,y(x)^4 + y(x)^5\,x = C1 \tag{8}$$

> $EcuacionOriginal := simplify(isolate(diff(SOLUCION, x), diff(y(x), x)));$

$$EcuacionOriginal := \frac{d}{dx}\,y(x) = -\frac{y(x)\left(3\,x^2 + 2\,x\,y(x)^2 + y(x)^3\right)}{x\left(2\,x^2 + 4\,x\,y(x)^2 + 5\,y(x)^3\right)} \tag{9}$$

> $EcuacionDos := isolate(Ecuacion, diff(y(x), x))$

$$EcuacionDos := \frac{d}{dx}\,y(x) = \frac{-3\,x^2\,y(x)^2 - 2\,x\,y(x)^4 - y(x)^5}{2\,x^3\,y(x) + 4\,x^2\,y(x)^3 + 5\,x\,y(x)^4} \tag{10}$$

> $comprobacion_2 := simplify(rhs(EcuacionOriginal) - rhs(EcuacionDos)) = 0$

$$comprobacion_2 := 0 = 0 \tag{11}$$

> $SOLSOL := dsolve(Ecuacion)$

$$SOLSOL := y(x) = 0,\ x^3\,y(x)^2 + x^2\,y(x)^4 + y(x)^5\,x + \_C1 = 0 \tag{12}$$

> **restart**

>

$$E\ DO.) NL$$

$$\left(e^{x}\cos(5y)+3x^{2}\right)+\left(-5e^{x}\,sen(5y)+8y\right)\frac{dy}{dx}=0$$

> $Ecuacion := \exp(x)\cdot\cos(5\cdot y(x))+3\cdot x\cdot\cdot 2+(-5\cdot\exp(x)\cdot\sin(5\cdot y(x))+8\cdot y(x))\cdot diff(y(x),$
$\quad x)=0$

$$Ecuacion := e^{x}\cos(5\,y(x))+3\,x^{2}+\left(-5\,e^{x}\sin(5\,y(x))+8\,y(x)\right)\left(\frac{d}{dx}\,y(x)\right)=0 \tag{13}$$

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

$$[\_exact] \tag{14}$$

> $M(x,y):=\exp(x)\cdot\cos(5\cdot y)+3\cdot x\cdot\cdot 2$

$$M(x,y):=e^{x}\cos(5\,y)+3\,x^{2} \tag{15}$$

> $N(x,y):=-5\cdot\exp(x)\cdot\sin(5\cdot y)+8\cdot y$

$$N(x,y):=-5\,e^{x}\sin(5\,y)+8\,y \tag{16}$$

> $IntMx:=int(M(x,y),x)$

$$IntMx:=e^{x}\cos(5\,y)+x^{3} \tag{17}$$

> $SolucionGeneral:=IntMx+int((N(x,y)-diff(IntMx,y)),y)=C1$

$$SolucionGeneral:=e^{x}\cos(5\,y)+x^{3}+4\,y^{2}=C1 \tag{18}$$

> $SolSol:=dsolve(Ecuacion)$

$$SolSol:=e^{x}\cos(5\,y(x))+x^{3}+4\,y(x)^{2}+\_C1=0 \tag{19}$$

> $Incognita:=isolate(SolSol,y(x))$

$$Incognita:=e^{x}\cos(5\,y(x))+4\,y(x)^{2}=-x^{3}-\_C1 \tag{20}$$

>