

```

> restart
> Ecuacion := -2·x·y(x) + (3·x·2 - y(x)·2)·diff(y(x), x) = 0
      Ecuacion := -2 x y(x) + (3 x^2 - y(x)^2) (d/dx y(x)) = 0 (1)
> with(DEtools):
> odeadvisor(Ecuacion)
      [[_homogeneous, class A], _rational, _dAlembert] (2)
> intfactor(Ecuacion)
      1
      y(x)^4 (3)
> EcuacionDos := simplify(isolate(eval(subs(y(x) = u(x)·x, Ecuacion)), diff(u(x), x)))
      EcuacionDos := d/dx u(x) = - u(x) (-1 + u(x)^2) / (x (-3 + u(x)^2)) (4)
> P := u (-1 + u^2) / (-3 + u^2)
      P := u (-1 + u^2) / (-3 + u^2) (5)
> Sg := int(1/x, x) + int(1/P, u) = C1
      Sg := ln(x) - ln(u + 1) + 3 ln(u) - ln(u - 1) = C1 (6)
> SolucionGeneralIntermedia := simplify(exp(lhs(Sg)) = C1)
      SolucionGeneralIntermedia := x u^3 / (-1 + u^2) = C1 (7)
> SolucionGeneralFinal := expand(simplify((subs(u = y/x, SolucionGeneralIntermedia))))
      SolucionGeneralFinal := - y^3 / (x^2 - y^2) = C1 (8)
> M := -2 x y
      M := -2 x y (9)
> N := 3 x^2 - y^2
      N := 3 x^2 - y^2 (10)
> FactInt := 1 / (y·4)
      FactInt := 1 / y^4 (11)
> MM := simplify(M·FactInt)
      MM := - 2 x / y^3 (12)
> NN := expand(N·FactInt)
      NN := (3 x^2 - y^2) / y^4 (13)

```

$$NN := \frac{3x^2}{y^4} - \frac{1}{y^2} \quad (13)$$

$$> \text{Comprobacion}_1 := \text{simplify}(\text{diff}(MM, y) - \text{diff}(NN, x)) = 0$$

$$\text{Comprobacion}_1 := 0 = 0 \quad (14)$$

$$> \text{IntMM} := \text{int}(MM, x)$$

$$\text{IntMM} := -\frac{x^2}{y^3} \quad (15)$$

$$> \text{SolucionGeneralDos} := \text{IntMM} + \text{int}((NN - \text{diff}(\text{IntMM}, y)), y) = C_1$$

$$\text{SolucionGeneralDos} := -\frac{x^2}{y^3} + \frac{1}{y} = C_1 \quad (16)$$

$$> \text{SolucionGeneralFinal}$$

$$-\frac{y^3}{x^2 - y^2} = C_1 \quad (17)$$

$$> \text{SolucionUno} := \frac{1}{\text{lhs}(\text{SolucionGeneralFinal})} = C_1$$

$$\text{SolucionUno} := -\frac{x^2 - y^2}{y^3} = C_1 \quad (18)$$

$$> \text{Comprobacion}_2 := \text{simplify}(\text{lhs}(\text{SolucionGeneralDos}) - \text{lhs}(\text{SolucionUno})) = 0$$

$$\text{Comprobacion}_2 := 0 = 0 \quad (19)$$

>

$$\mathbf{149. \quad C (y^2 - x^2) = y^3.}$$