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> restart
> Ecua := (x + y^2) + (-2*x*y)·y'=0
      Ecua := x + y(x)^2 - 2 x y(x) ⎛ d
      dx
      y(x) ⎞ = 0 (1)

> with(DEtools):
> odeadvisor(Ecua)
      [_homogeneous, class G], _rational, _Bernoulli (2)

> IntFact := intfactor(Ecua)
      IntFact := 1
      x^2 (3)

> M := x + y^2
      M := y^2 + x (4)

> N := -2·x·y
      N := -2 x y (5)

> MM := expand(IntFact·M)
      MM := y^2
      x^2 + 1
      x (6)

> NN := IntFact·N
      NN := - 2 y
      x (7)

> EcuaDos := y(x)^2
      x^2 + 1
      x - 2·y(x)
      x ·diff(y(x), x) = 0
      EcuaDos := y(x)^2
      x^2 + 1
      x - 2 y(x) ⎛ d
      dx
      y(x) ⎞ = 0 (8)

> odeadvisor(EcuaDos)
      [_homogeneous, class G], _exact, _rational, _Bernoulli (9)

> IntMMx := int(MM, x)
      IntMMx := ln(x) - y^2
      x (10)

> SolGral := IntMMx + int((NN - diff(IntMMx, y)), y) = _C1
      SolGral := ln(x) - y^2
      x = _C1 (11)

> SolGralDos := ln(x) - y(x)^2
      x = _C1
      SolGralDos := ln(x) - y(x)^2
      x = _C1 (12)

> DerSolGralDos := expand(isolate(diff(SolGralDos, x), diff(y(x), x)))

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$$DerSolGralDos := \frac{d}{dx} y(x) = \frac{y(x)}{2x} + \frac{1}{2y(x)} \quad (13)$$

> Ecua

$$x + y(x)^2 - 2xy(x) \left( \frac{d}{dx} y(x) \right) = 0 \quad (14)$$

> DerEcua := expand(isolate(Ecua, diff(y(x), x)))

$$DerEcua := \frac{d}{dx} y(x) = \frac{y(x)}{2x} + \frac{1}{2y(x)} \quad (15)$$

> Comprobar := simplify(rhs(DerSolGralDos) - rhs(DerEcua) = 0)

$$Comprobar := 0 = 0 \quad (16)$$

> restart

> Ecua := 2·x·y·log(y) + (x<sup>2</sup> + y<sup>2</sup>·sqrt(y<sup>2</sup> + 1))·y' = 0

$$Ecua := 2xy(x) \ln(y(x)) + (x^2 + y(x)^2 \sqrt{y(x)^2 + 1}) \left( \frac{d}{dx} y(x) \right) = 0 \quad (17)$$

> with(DEtools):

> odeadvisor(Ecua)

$$[[\_1st\_order, \_with\_symmetry\_ [F(x)*G(y), 0]]] \quad (18)$$

> intfactor(Ecua)

$$\frac{1}{y(x)} \quad (19)$$

> IntFactor :=  $\frac{1}{y}$

$$IntFactor := \frac{1}{y} \quad (20)$$

> M := 2·x·y·log(y)

$$M := 2x \ln(y) y \quad (21)$$

> N := x<sup>2</sup> + y<sup>2</sup>·sqrt(y<sup>2</sup> + 1)

$$N := x^2 + y^2 \sqrt{y^2 + 1} \quad (22)$$

> MM := IntFactor·M

$$MM := 2x \ln(y) \quad (23)$$

> NN := expand(IntFactor·N)

$$NN := \frac{x^2}{y} + y \sqrt{y^2 + 1} \quad (24)$$

> EcuaCuatro := 2x ln(y(x)) +  $\left( \frac{x^2}{y(x)} + y(x) \sqrt{y(x)^2 + 1} \right) \cdot y' = 0$

$$EcuaCuatro := 2x \ln(y(x)) + \left( \frac{x^2}{y(x)} + y(x) \sqrt{y(x)^2 + 1} \right) \left( \frac{d}{dx} y(x) \right) = 0 \quad (25)$$

> odeadvisor(EcuaCuatro)

$$[_exact, [_1st\_order, \_with\_symmetry\_ [F(x)*G(y), 0]]] \quad (26)$$

> IntMMx := int(MM, x)

$$IntMMx := x^2 \ln(y) \quad (27)$$

$$> SolGralCuatro := IntMMx + int((NN - diff(IntMMx, y)), y) = C1$$

$$SolGralCuatro := x^2 \ln(y) + \frac{(y^2 + 1)^{3/2}}{3} = c_1 \quad (28)$$

$$> SolGralFinal := x^2 \ln(y(x)) + \frac{(y(x)^2 + 1)^{3/2}}{3} = c_1$$

$$SolGralFinal := x^2 \ln(y(x)) + \frac{(y(x)^2 + 1)^{3/2}}{3} = c_1 \quad (29)$$

$$> DerSolGralFinal := simplify(isolate(diff(SolGralFinal, x), diff(y(x), x)))$$

$$DerSolGralFinal := \frac{d}{dx} y(x) = - \frac{2 x y(x) \ln(y(x))}{x^2 + y(x)^2 \sqrt{y(x)^2 + 1}} \quad (30)$$

$$> DerEcua := isolate(Ecua, diff(y(x), x))$$

$$DerEcua := \frac{d}{dx} y(x) = - \frac{2 x y(x) \ln(y(x))}{x^2 + y(x)^2 \sqrt{y(x)^2 + 1}} \quad (31)$$

$$> Comprobar := simplify(rhs(DerSolGralFinal) - rhs(DerEcua) = 0)$$

$$Comprobar := 0 = 0 \quad (32)$$

$$> SolGralNueva := dsolve(Ecua)$$

$$SolGralNueva := x^2 \ln(y(x)) + \frac{(y(x)^2 + 1)^{3/2}}{3} + c_1 = 0 \quad (33)$$

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> restart

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