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> restart
> Ecua := (3·x²·y² - 12·x·y³ + 8·y⁴) + (2·x³y - 18·x²·y² + 32·x·y³)·y'=0
Ecua := 3 x² y(x)² - 12 x y(x)³ + 8 y(x)⁴ + (2 x³ y(x) - 18 x² y(x)² + 32 x y(x)³) ( d/dx y(x) ) (1)
=0
with(DEtools):
> odeadvisor(Ecua)
[[_homogeneous, class A], _exact, _rational, _dAlembert] (2)
> M := 3 x² y² - 12 x y³ + 8 y⁴
M := 3 x² y² - 12 x y³ + 8 y⁴ (3)
> N := 2 x³ y - 18 x² y² + 32 x y³
N := 2 x³ y - 18 x² y² + 32 x y³ (4)
> IntMx := expand(int(M, x))
IntMx := x³ y² - 6 x² y³ + 8 x y⁴ (5)
> SolGral := IntMx + int((N - diff(IntMx, y)), y) = _C1
SolGral := x³ y² - 6 x² y³ + 8 x y⁴ = _C1 (6)
> IntNy := expand(int(N, y))
IntNy := x³ y² - 6 x² y³ + 8 x y⁴ (7)
> SolGralDos := IntNy + int((M - diff(IntNy, x)), x) = _C1
SolGralDos := x³ y² - 6 x² y³ + 8 x y⁴ = _C1 (8)
> restart
> Ecua := ( x/sqrt(x² + y²) + 1/x + 1/y ) + ( y/sqrt(x² + y²) + 1/y - x/y² )·y'=0
Ecua := x/sqrt(x² + y(x)²) + 1/x + 1/y(x) + ( y(x)/sqrt(x² + y(x)²) + 1/y(x) - x/y(x)² ) ( d/dx y(x) ) = 0 (9)
with(DEtools):
> odeadvisor(Ecua)
[_exact] (10)
> M := x/sqrt(x² + y²) + 1/x + 1/y
M := x/sqrt(x² + y²) + 1/x + 1/y (11)
> N := y/sqrt(x² + y²) + 1/y - x/y²
N := y/sqrt(x² + y²) + 1/y - x/y² (12)
> IntMx := int(M, x)

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$$IntMx := \ln(x) + \frac{x}{y} + \sqrt{x^2 + y^2} \quad (13)$$

> IntNy := int(N, y)

$$IntNy := \ln(y) + \sqrt{x^2 + y^2} + \frac{x}{y} \quad (14)$$

> SolGralUno := IntMx + int((N - diff(IntMx, y)), y) = _C1

$$SolGralUno := \ln(x) + \frac{x}{y} + \sqrt{x^2 + y^2} + \ln(y) = _C1 \quad (15)$$

> SolGralDos := IntNy + int((M - diff(IntNy, x)), x) = _C1

$$SolGralDos := \ln(x) + \frac{x}{y} + \sqrt{x^2 + y^2} + \ln(y) = _C1 \quad (16)$$

> restart

> Ecua := (3·x²·y - 12·x·y² + 8·y³) + (2·x³ - 18·x²·y + 32·x·y²)·y' = 0

$$Ecua := 3x^2y(x) - 12xy(x)^2 + 8y(x)^3 + (2x^3 - 18x^2y(x) + 32xy(x)^2) \left(\frac{d}{dx} y(x) \right) = 0 \quad (17)$$

> with(DEtools) :

> odeadvisor(Ecua)

$$[_homogeneous, class A], _rational, _dAlembert] \quad (18)$$

> intfactor(Ecua)

$$y(x) \quad (19)$$

> FactInt := y

$$FactInt := y \quad (20)$$

> MM := 3x²y - 12xy² + 8y³

$$MM := 3x^2y - 12xy^2 + 8y^3 \quad (21)$$

> NN := 2x³ - 18x²y + 32xy²

$$NN := 2x^3 - 18x^2y + 32xy^2 \quad (22)$$

> MMM := expand(MM·FactInt)

$$MMM := 3x^2y^2 - 12xy^3 + 8y^4 \quad (23)$$

> NNN := expand(NN·FactInt)

$$NNN := 2x^3y - 18x^2y^2 + 32xy^3 \quad (24)$$

> Comprobar := diff(MMM, y) = diff(NNN, x)

$$Comprobar := 6x^2y - 36xy^2 + 32y^3 = 6x^2y - 36xy^2 + 32y^3 \quad (25)$$

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