```
> restart
> Ecua := (sin(x·y(x)) + x·y(x)·cos(x·y(x))) + (x··2·cos(x·y(x)))·diff(y(x), x)
```

$$Ecua := \sin(x\,y(x)) + x\,y(x)\cos(x\,y(x)) + x^2\cos(x\,y(x))\left(\frac{d}{dx}y(x)\right) \quad (1)$$

```
> with(DEtools):
> odeadvisor(Ecua)
```

$$[[\_homogeneous, class\ G], \_exact] \quad (2)$$

```
> M(x, y) := sin(x y) + x y cos(x y)
```

$$M(x, y) := \sin(x\,y) + x\,y\cos(x\,y) \quad (3)$$

```
> N(x, y) := x^2 cos(x y)
```

$$N(x, y) := x^2\cos(x\,y) \quad (4)$$

```
> ComprobacionUno := diff(M(x, y), y) = diff(N(x, y), x)
```

$$ComprobacionUno := 2\cos(x\,y)\,x - x^2\,y\sin(x\,y) = 2\cos(x\,y)\,x - x^2\,y\sin(x\,y) \quad (5)$$

```
> ComprobacionDos := diff(M(x, y), y) - diff(N(x, y), x) = 0
```

$$ComprobacionDos := 0 = 0 \quad (6)$$

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

$$IntMx := -\frac{\cos(x\,y)}{y} + \frac{\cos(x\,y) + \sin(x\,y)\,x\,y}{y} \quad (7)$$

```
> SolGral := simplify(IntMx + int((N(x, y) - diff(IntMx, y)), y)) = C
```

$$SolGral := \sin(x\,y)\,x = C \quad (8)$$

```
> IntNy := int(N(x, y), y)
```

$$IntNy := \sin(x\,y)\,x \quad (9)$$

```
> SolGralDos := simplify(IntNy + int((M(x, y) - diff(IntNy, x)), x)) = C
```

$$SolGralDos := \sin(x\,y)\,x = C \quad (10)$$

```
> exactsol(Ecua)
```

$$\left\{y(x) = -\frac{\arcsin\left(\frac{\_C1}{x}\right)}{x}\right\} \quad (11)$$

```
> restart
> Ecua := exp(y(x))·(1 + x··2)·diff(y(x), x) - 2·x·(1 + exp(y(x))) = 0
```

$$Ecua := e^{y(x)}\left(x^2+1\right)\left(\frac{d}{dx}y(x)\right) - 2\,x\left(1 + e^{y(x)}\right) = 0 \quad (12)$$

```
> with(DEtools);
```

[*AreSimilar*, *Closure*, *DEnormal*, *DEplot*, *DEplot3d*, *DEplot_polygon*, *DFactor*, *DFactorLCLM*, *DFactorsols*, *Dchangevar*, *Desingularize*, *FunctionDecomposition*, *GCRD*, *Gosper*, *Heunsols*, *Homomorphisms*, *IVPsol*, *IsHyperexponential*, *LCLM*, *MeijerGsols*, *MultiplicativeDecomposition*, *ODEInvariants*, *PDEchangecoords*, *PolynomialNormalForm*, *RationalCanonicalForm*, *ReduceHyperexp*, *RiemannPsols*, *Xchange*, *Xcommutator*, *Xgauge*, *Zeilberger*, *abelsol*, *adjoint*, *autonomous*, *bernoullisol*, *buildsol*, *buildsym*, *canoni*, *caseplot*, *casesplit*, *checkrank*, *chinisol*, *clairautsol*, *constcoeffsols*, *convertAlg*, *convertsys*, (13)

dalembertsol, dcoeffs, de2diffop, dfieldplot, diff_table, diffop2de, dperiodic_sols, dpolyform, dsubs, eigenring, endomorphism_charpoly, equinv, eta_k, eulersols, exactsol, expsols, exterior_power, firint, firtest, formal_sol, gen_exp, generate_ic, genhomosol, gensys, hamilton_eqs, hypergeomsols, hyperode, indicialeq, infgen, initialdata, integrate_sols, intfactor, invariants, kovacicsols, leftdivision, liesol, line_int, linearsol, matrixDE, matrix_riccati, maxdimsystems, moser_reduce, muchange, mult, mutest, newton_polygon, normalG2, ode_int_y, ode_y1, odeadvisor, odepde, parametricsol, particularsol, phaseportrait, poincare, polysols, power_equivalent, rational_equivalent, ratsols, redode, reduceOrder, reduce_order, regular_parts, regularsp, remove_RootOf, riccati_system, riccatisol, rifread, rifsimp, rightdivision, rtaylor, separablesol, singularities, solve_group, super_reduce, symgen, symmetric_power, symmetric_product, symtest, transinv, translate, untranslate, varparam, zoom]

> *odeadvisor*(*Ecua*)

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

> *SolGral* := *separablesol*(*Ecua*)

$$SolGral := \{y(x) = \ln(\_C1\, x^2 + \_C1 - 1)\} \tag{15}$$

> *Ecua*

$$e^{y(x)}\,(x^2+1)\left(\frac{d}{dx}\,y(x)\right) - 2\,x\,(1+e^{y(x)}) = 0 \tag{16}$$

> $P(x) := -2\,x$

$$P(x) := -2\,x \tag{17}$$

> $Q(y) := 1 + e^{y}$

$$Q(y) := 1 + e^{y} \tag{18}$$

> $R(x) := x^2 + 1$

$$R(x) := x^2 + 1 \tag{19}$$

> $S(y) := e^{y}$

$$S(y) := e^{y} \tag{20}$$

> $SolGralDos := simplify\left(\exp\left(int\left(\frac{P(x)}{R(x)}, x\right) + int\left(\frac{S(y)}{Q(y)}, y\right)\right)\right) = C$

$$SolGralDos := \frac{1+e^{y}}{x^2+1} = C \tag{21}$$

> *restart*

>