```
> restart
> Ecuacion := (1 + y(x)^2) + x·y(x)·diff(y(x), x) = 0
```

$$Ecuacion := 1 + y(x)^2 + x\,y(x)\left(\frac{\mathrm{d}}{\mathrm{d}x}\,y(x)\right) = 0 \tag{1}$$

```
> with(DEtools)
```

$[AreSimilar, DEnormal, DEplot, DEplot3d, DEplot\_polygon, DFactor, DFactorLCLM,$ (2)
$\quad DFactorsols, Dchangevar, FunctionDecomposition, GCRD, Gosper, Heunsols,$
$\quad Homomorphisms, IVPsol, IsHyperexponential, LCLM, MeijerGsols,$
$\quad MultiplicativeDecomposition, ODEInvariants, PDEchangecoords, PolynomialNormalForm,$
$\quad RationalCanonicalForm, ReduceHyperexp, RiemannPsols, Xchange, Xcommutator, Xgauge,$
$\quad Zeilberger, abelsol, adjoint, autonomous, bernoullisol, buildsol, buildsym, canoni, caseplot,$
$\quad casesplit, checkrank, chinisol, clairautsol, constcoeffsols, convertAlg, convertsys,$
$\quad dalembertsol, dcoeffs, de2diffop, dfieldplot, diff\_table, diffop2de, dperiodic\_sols, dpolyform,$
$\quad dsubs, eigenring, endomorphism\_charpoly, equinv, eta\_k, eulersols, exactsol, expsols,$
$\quad exterior\_power, firint, firtest, formal\_sol, gen\_exp, generate\_ic, genhomosol, gensys,$
$\quad hamilton\_eqs, hypergeomsols, hyperode, indicialeq, infgen, initialdata, integrate\_sols,$
$\quad intfactor, invariants, kovacicsols, leftdivision, liesol, line\_int, linearsol, matrixDE,$
$\quad matrix\_riccati, maxdimsystems, moser\_reduce, muchange, mult, mutest, newton\_polygon,$
$\quad normalG2, ode\_int\_y, ode\_y1, odeadvisor, odepde, parametricsol, particularsol,$
$\quad phaseportrait, poincare, polysols, power\_equivalent, rational\_equivalent, ratsols, redode,$
$\quad reduceOrder, reduce\_order, regular\_parts, regularsp, remove\_RootOf, riccati\_system,$
$\quad riccatisol, rifread, rifsimp, rightdivision, rtaylor, separablesol, singularities, solve\_group,$
$\quad super\_reduce, symgen, symmetric\_power, symmetric\_product, symtest, transinv, translate,$
$\quad untranslate, varparam, zoom]$

```
> odeadvisor(Ecuacion)
```

$$[\_separable] \tag{3}$$

```
> Ecuacion
```

$$1 + y(x)^2 + x\,y(x)\left(\frac{\mathrm{d}}{\mathrm{d}x}\,y(x)\right) = 0 \tag{4}$$

```
> M := 1 + y^2
```

$$M := 1 + y^2 \tag{5}$$

```
> N := x y
```

$$N := x\,y \tag{6}$$

```
> P := 1; Q := 1 + y^2; R := x; S := y
```

$$P := 1$$
$$Q := 1 + y^2$$
$$R := x$$
$$S := y \tag{7}$$

```
> SolucionGeneral := int(P/R, x) + int(S/Q, y) = C_1
```

$$SolucionGeneral := \ln(x) + \frac{1}{2}\ln(1 + y^2) = C_1 \tag{8}$$

```
> SolucionIntermedia := simplify(isolate(SolucionGeneral, x))
```

$$SolucionIntermedia := x = \frac{e^{C_1}}{\sqrt{1 + y^2}} \tag{9}$$

> $SolucionFinal := lhs(SolucionIntermedia) \cdot \sqrt{1 + y^2} = C_1$

$$SolucionFinal := x\sqrt{1 + y^2} = C_1 \tag{10}$$

> $Solucion := dsolve(Ecuacion)$

$$Solucion := y(x) = \frac{\sqrt{-x^2 + \_C1}}{x}, \, y(x) = -\frac{\sqrt{-x^2 + \_C1}}{x} \tag{11}$$

> $restart$
>
>

$$\textbf{83. } (y^2 + xy^2)\, y' + x^2 - yx^2 = 0.$$

> $Ecuacion := (y \cdot \cdot 2 + x \cdot y \cdot \cdot 2) \cdot y' + x \cdot \cdot 2 - y \cdot x \cdot \cdot 2 = 0$

$$Ecuacion := \left(y(x)^2 + x\, y(x)^2\right)\left(\frac{d}{dx}\, y(x)\right) + x^2 - y(x)\, x^2 = 0 \tag{12}$$

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

$$[\_separable\,] \tag{13}$$

> $M := factor(x^2 - y \cdot x^2)$

$$M := -x^2\,(-1 + y) \tag{14}$$

> $N := factor(y^2 + x \cdot y^2)$

$$N := y^2\,(1 + x) \tag{15}$$

> $P := -x \cdot \cdot 2; Q := -1 + y; R := 1 + x; S := y \cdot \cdot 2$

$$P := -x^2$$
$$Q := -1 + y$$
$$R := 1 + x$$
$$S := y^2 \tag{16}$$

> $SolucionInicial := int\left(\frac{P}{R}, x\right) + int\left(\frac{S}{Q}, y\right) = C_1$

$$SolucionInicial := -\frac{1}{2}\, x^2 + x - \ln(1 + x) + y + \frac{1}{2}\, y^2 + \ln(-1 + y) = C_1 \tag{17}$$

> $SolucionIntermedia := lhs(SolucionInicial) \cdot 2 = C_1$

$$SolucionIntermedia := -x^2 + 2\,x - 2\ln(1 + x) + 2\,y + y^2 + 2\ln(-1 + y) = C_1 \tag{18}$$

> $SolucionGeneral := -(x + 1) \cdot \cdot 2 + (y + 1) \cdot \cdot 2 + \log\left(\frac{(-1 + y) \cdot \cdot 2}{(1 + x) \cdot \cdot 2}\right) = C_1$

$$\tag{19}$$
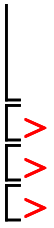
$$SolucionGeneral := -(1+x)^2 + (y+1)^2 + \ln\left(\frac{(-1+y)^2}{(1+x)^2}\right) = C_1 \qquad\qquad \textbf{(19)}$$

>
>
>