

```

> restart
> Ecua := diff(z(x,y), x$2) - 6*diff(z(x,y), y) = z(x,y)
      Ecua :=  $\frac{\partial^2}{\partial x^2} z(x,y) - 6 \frac{\partial}{\partial y} z(x,y) = z(x,y)$  (1)
=
> SolGralUno := z(x,y) = exp(-y/6) * (_C10*x + _C20)
      SolGralUno :=  $z(x,y) = e^{-\frac{y}{6}} (_C10 x + _C20)$  (2)
=
> ComprobarUno := simplify(eval(subs(z(x,y) = rhs(SolGralUno), lhs(Ecua) - rhs(Ecua)
      = 0)))
      ComprobarUno := 0 = 0 (3)
=
> SolGralDos := z(x,y) = exp((beta^2 - 1)*y/6) * (_C10*exp(beta*x) + _C20*exp(-beta*x))
      SolGralDos :=  $z(x,y) = e^{\frac{(\beta^2 - 1)y}{6}} (_C10 e^{\beta x} + _C20 e^{-\beta x})$  (4)
=
> ComprobarDos := simplify(eval(subs(z(x,y) = rhs(SolGralDos), lhs(Ecua) - rhs(Ecua)
      = 0)))
      ComprobarDos := 0 = 0 (5)
=
> SolGralTres := z(x,y) = exp(-(beta^2 + 1)*y/6) * (_C10*cos(beta*x) + _C20*sin(beta*x))
      SolGralTres :=  $z(x,y) = e^{-\frac{(\beta^2 + 1)y}{6}} (_C10 \cos(\beta x) + _C20 \sin(\beta x))$  (6)
=
> ComprobarTres := simplify(eval(subs(z(x,y) = rhs(SolGralTres), lhs(Ecua) - rhs(Ecua)
      = 0)))
      ComprobarTres := 0 = 0 (7)
=
> Ecua
       $\frac{\partial^2}{\partial x^2} z(x,y) - 6 \frac{\partial}{\partial y} z(x,y) = z(x,y)$  (8)
=
> with(PDETools)
[CanonicalCoordinates, ChangeSymmetry, CharacteristicQ, CharacteristicQInvariants,
ConservedCurrentTest, ConservedCurrents, ConsistencyTest, D_Dx, DeterminingPDE, Eta_k,
Euler, FirstIntegralSolver, FromJet, FunctionFieldSolutions, InfinitesimalGenerator,
Infinitesimals, IntegratingFactorTest, IntegratingFactors, InvariantEquation,
InvariantSolutions, InvariantTransformation, Invariants, Laplace, Library, PDEplot,
PolynomialSolutions, ReducedForm, SimilaritySolutions, SimilarityTransformation, Solve,
SymmetryCommutator, SymmetryGauge, SymmetrySolutions, SymmetryTest,
SymmetryTransformation, TWSolutions, ToJet, ToMissingDependentVariable, build, casesplit,
charstrip, dchange, dcoeffs, declare, diff_table, difforder, dpolyform, dsubs, mapde, separability,
splitstrip, splitsys, undeclare]
> SolGralFinal := build(pdsolve(Ecua))

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$$SolGralFinal := z(x, y) = c_3 e^{\frac{y-c_1}{6}} e^{-\frac{y}{6}} c_1 e^{\sqrt{-c_1} x} + \frac{c_3 e^{\frac{y-c_1}{6}} e^{-\frac{y}{6}} c_2}{e^{\sqrt{-c_1} x}} \quad (10)$$

$$\begin{aligned} & \text{ComprobarFinal} := \text{simplify}(\text{eval}(\text{subs}(z(x, y) = \text{rhs}(SolGralFinal), \text{lhs}(Ecua) - \text{rhs}(Ecua) \\ & \quad = 0))) \\ & \text{ComprobarFinal} := 0 = 0 \end{aligned} \quad (11)$$