

```

> restart
> Ecua := diff(y(t), t$2) + 2·diff(y(t), t) + y(t) = Dirac(t - 1)
      Ecua :=  $\frac{d^2}{dt^2} y(t) + 2 \left( \frac{d}{dt} y(t) \right) + y(t) = \text{Dirac}(t - 1)$  (1)
> EcuaCinco := diff(y(t), t$2) + 4·y(t) = sin(t)·Heaviside(t - 2·Pi)
      EcuaCinco :=  $\frac{d^2}{dt^2} y(t) + 4 y(t) = \sin(t) \text{Heaviside}(t - 2 \pi)$  (2)
> restart
> EcuaDerPar := diff(z(x, y), x$2) + 5·diff(z(x, y), x, y) + 6·diff(z(x, y), y$2) = 0
      EcuaDerPar :=  $\frac{\partial^2}{\partial x^2} z(x, y) + 5 \left( \frac{\partial^2}{\partial y \partial x} z(x, y) \right) + 6 \left( \frac{\partial^2}{\partial y^2} z(x, y) \right) = 0$  (3)
> SolGral := z(x, y) = _F[1](y - 2·x) + _F[2](y - 3·x)
      SolGral :=  $z(x, y) = \_F_1(y - 2 x) + \_F_2(y - 3 x)$  (4)
> Comprobar := simplify(eval(subs(z(x, y) = rhs(SolGral), EcuaDerPar)))
      Comprobar := 0 = 0 (5)
> SolPart := z(x, y) = 5·exp(y - 2·x) + 4·cos(y - 3·x)
      SolPart :=  $z(x, y) = 5 e^{y - 2 x} + 4 \cos(-y + 3 x)$  (6)
> ComprobarUno := simplify(eval(subs(z(x, y) = rhs(SolPart), EcuaDerPar)))
      ComprobarUno := 0 = 0 (7)
> with(PDEtools)
[CanonicalCoordinates, ChangeSymmetry, CharacteristicQ, CharacteristicQInvariants,
ConservedCurrentTest, ConservedCurrents, ConsistencyTest, D_Dx, DeterminingPDE,
Eta_k, Euler, 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, build, casesplit, charstrip, dchange, dcoeffs, declare, diff_table,
difforder, dpolyform, dsubs, mapde, separability, splitstrip, splitsys, undeclare]
> SolGralDos := pdsolve(EcuaDerPar)
      SolGralDos :=  $z(x, y) = \_F1(y - 3 x) + \_F2(y - 2 x)$  (9)
> restart
> Ecua := diff(y(x, t), t$2) - 2·diff(y(x, t), x, t) + diff(y(x, t), x$2) = 0
      Ecua :=  $\frac{\partial^2}{\partial t^2} y(x, t) - 2 \left( \frac{\partial^2}{\partial x \partial t} y(x, t) \right) + \frac{\partial^2}{\partial x^2} y(x, t) = 0$  (10)
> SolGral := pdsolve(Ecua)
      SolGral :=  $y(x, t) = \_F1(t + x) + \_F2(t + x) x$  (11)
> SolGralOtra := y(x, t) = _F1(t + x) + _F2(x + t)·t
      SolGralOtra :=  $y(x, t) = \_F1(t + x) + \_F2(t + x) t$  (12)
> Comprobar := simplify(eval(subs(y(x, t) = rhs(SolGral), Ecua)))
      Comprobar := 0 = 0 (13)
> ComprobarUno := simplify(eval(subs(y(x, t) = rhs(SolGralOtra), Ecua)))

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ComprobarUno := 0 = 0

(14)