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> restart
> Ecuacion := 2·diff(z(x, y), x$2, y) - 2·diff(z(x, y), x, y) = z(x, y)
      Ecuacion := 2 ⎛⎜  $\frac{\partial^3}{\partial y \partial x^2} z(x, y)$  ⎟⎟ - 2 ⎛⎜  $\frac{\partial^2}{\partial y \partial x} z(x, y)$  ⎟⎟ = z(x, y) (1)

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> EcuacionDos := eval(subs(z(x, y) = F(x)·G(y), Ecuacion))
      EcuacionDos := 2 ⎛⎜  $\frac{d^2}{dx^2} F(x)$  ⎟⎟ ⎛⎜  $\frac{d}{dy} G(y)$  ⎟⎟ - 2 ⎛⎜  $\frac{d}{dx} F(x)$  ⎟⎟ ⎛⎜  $\frac{d}{dy} G(y)$  ⎟⎟ = F(x) G(y) (2)

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> EcuacionTres := simplify(⎛⎜  $\frac{lhs(EcuacionDos)}{2·F(x)·diff(G(y), y)}$  ⎟⎟) = simplify(⎛⎜  $\frac{rhs(EcuacionDos)}{2·F(x)·diff(G(y), y)}$  ⎟⎟)
      EcuacionTres :=  $\frac{\frac{d^2}{dx^2} F(x) - \left(\frac{d}{dx} F(x)\right)}{F(x)} = \frac{1}{2} \frac{G(y)}{\frac{d}{dy} G(y)}$  (3)

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> EcuacionX := lhs(EcuacionTres) = -1
      EcuacionX :=  $\frac{\frac{d^2}{dx^2} F(x) - \left(\frac{d}{dx} F(x)\right)}{F(x)} = -1$  (4)

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> EcuacionY := rhs(EcuacionTres) = -1
      EcuacionY :=  $\frac{1}{2} \frac{G(y)}{\frac{d}{dy} G(y)} = -1$  (5)

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> SolucionX := dsolve(EcuacionX); SolucionY := dsolve(EcuacionY)
      SolucionX := F(x) = _C1 e $\frac{1}{2}x$  sin⎛⎜  $\frac{1}{2} \sqrt{3} x$  ⎟⎟ + _C2 e $\frac{1}{2}x$  cos⎛⎜  $\frac{1}{2} \sqrt{3} x$  ⎟⎟
      SolucionY := G(y) = _C1 e $-\frac{1}{2}y$  (6)

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> Ecuacion
      2 ⎛⎜  $\frac{\partial^3}{\partial y \partial x^2} z(x, y)$  ⎟⎟ - 2 ⎛⎜  $\frac{\partial^2}{\partial y \partial x} z(x, y)$  ⎟⎟ = z(x, y) (7)

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> SolucionGeneral := z(x, y) = rhs(SolucionX)·subs(_C1 = 1, rhs(SolucionY))
      SolucionGeneral := z(x, y) = ⎛⎜  $-\text{C1} e^{\frac{1}{2}x} \sin\left(\frac{1}{2} \sqrt{3} x\right) + \text{C2} e^{\frac{1}{2}x} \cos\left(\frac{1}{2} \sqrt{3} x\right)$  ⎟⎟ e $-\frac{1}{2}y$  (8)

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> Comprobacion1 := simplify(eval(subs(z(x, y) = rhs(SolucionGeneral), lhs(Ecuacion)
      - rhs(Ecuacion) = 0)))
      Comprobacion1 := 0 = 0 (9)

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