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> restart
> Ecua := diff(y(x, t), x$2) + 5·diff(y(x, t), x, t) + 6·diff(y(x, t), t$2) = 0
      Ecua :=  $\frac{\partial^2}{\partial x^2} y(x, t) + 5 \frac{\partial^2}{\partial t \partial x} y(x, t) + 6 \frac{\partial^2}{\partial t^2} y(x, t) = 0$  (1)
=
> SolGral := pdsolve(Ecua)
      SolGral :=  $y(x, t) = f_1(t - 3x) + f_2(t - 2x)$  (2)
=
> ComprobarCero := simplify(eval(subs(y(x, t) = rhs(SolGral), Ecua)))
      ComprobarCero := 0 = 0 (3)
=
> SolPartUno := y(x, t) = (t - 3x)3 + 4·(t - 2x)2
      SolPartUno :=  $y(x, t) = (t - 3x)^3 + 4(t - 2x)^2$  (4)
=
> ComprobarUno := simplify(eval(subs(y(x, t) = rhs(SolPartUno), Ecua)))
      ComprobarUno := 0 = 0 (5)
=
> SolPartDos := y(x, t) = cos(t - 3x) + sin(t - 2x)
      SolPartDos :=  $y(x, t) = \cos(t - 3x) + \sin(t - 2x)$  (6)
=
> ComprobarDos := simplify(eval(subs(y(x, t) = rhs(SolPartDos), Ecua)))
      ComprobarDos := 0 = 0 (7)
=
> SolPartTres := y(x, t) = exp(t - 2x)·cos(t - 2·x) + exp(t - 3x)
      SolPartTres :=  $y(x, t) = e^{t-2x} \cos(t - 2x) + e^{t-3x}$  (8)
=
> ComprobarTres := simplify(eval(subs(y(x, t) = rhs(SolPartTres), Ecua)))
      ComprobarTres := 0 = 0 (9)
=
> restart
> Ecua := diff(z(x, y), x$2) - 4·diff(z(x, y), x, y) + 4·diff(z(x, y), y$2) = 0
      Ecua :=  $\frac{\partial^2}{\partial x^2} z(x, y) - 4 \frac{\partial^2}{\partial x \partial y} z(x, y) + 4 \frac{\partial^2}{\partial y^2} z(x, y) = 0$  (10)
=
> SolGral := pdsolve(Ecua)
      SolGral :=  $z(x, y) = f_1(y + 2x) + f_2(y + 2x)x$  (11)
=
> SolGralDos := z(x, y) = f1(y + 2x) + f2(y + 2x)y
      SolGralDos :=  $z(x, y) = f_1(y + 2x) + f_2(y + 2x)y$  (12)
=
> ComprobarUno := simplify(eval(subs(z(x, y) = rhs(SolGral), Ecua)))
      ComprobarUno := 0 = 0 (13)
=
> ComprobarDos := simplify(eval(subs(z(x, y) = rhs(SolGralDos), Ecua)))
      ComprobarDos := 0 = 0 (14)
=
> restart
> Ecua := f(t) = 3·t2 - exp(-t) - int(f(tau)·exp(t - tau), tau = 0..t)
      Ecua :=  $f(t) = 3t^2 - e^{-t} - \left( \int_0^t f(\tau) e^{t-\tau} d\tau \right)$  (15)
=
> with(inttrans) :
> EcuaTL := laplace(Ecua, t, s)

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$$EcuaTL := \mathcal{L}(f(t), t, s) = \frac{6}{s^3} - \frac{1}{1+s} - \frac{\mathcal{L}(f(t), t, s)}{s-1} \quad (16)$$

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> SolTL := simplify(isolate(EcuaTL, laplace(f(t), t, s)))
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$$SolTL := \mathcal{L}(f(t), t, s) = -\frac{(s^3 - 6s - 6)(s-1)}{s^4(1+s)} \quad (17)$$

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> Sol := invlaplace(SolTL, s, t)
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$$Sol := f(t) = -2e^{-t} + 3t^2 - t^3 + 1 \quad (18)$$

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> restart
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>
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