

> restart		
> f := 1	$f := 1$	(1)
> with(inttrans)		
[addtable, fourier, fouriercos, fouriersin, hankel, hilbert, invfourier, invhilbert, invlaplace, invmellin, laplace, mellin, savetable, setup]		(2)
> F := laplace(f, t, s)	$F := \frac{1}{s}$	(3)
> g := t	$g := t$	(4)
> G := laplace(g, t, s)	$G := \frac{1}{s^2}$	(5)
> h := t^2	$h := t^2$	(6)
> H := laplace(h, t, s)	$H := \frac{2}{s^3}$	(7)
> j := exp(a·t)	$j := e^{a \cdot t}$	(8)
> J := laplace(j, t, s)	$J := \frac{1}{s - a}$	(9)
> k := t·exp(a·t)	$k := t e^{a \cdot t}$	(10)
> K := laplace(k, t, s)	$K := \frac{1}{(s - a)^2}$	(11)
> l := diff(y(t), t)	$l := \frac{d}{dt} y(t)$	(12)
> L := subs(y(0) = 10, laplace(l, t, s))	$L := s \mathcal{L}(y(t), t, s) - 10$	(13)
> m := diff(y(t), t\$2)	$m := \frac{d^2}{dt^2} y(t)$	(14)
> M := subs(y(0) = 10, D(y)(0) = -5, laplace(m, t, s))	$M := s^2 \mathcal{L}(y(t), t, s) + 5 - 10 s$	(15)

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> restart
> Ecua := y'' - 7·y' + 12·y = 5·exp(2·x) + x^2
      Ecua :=  $\frac{d^2}{dx^2} y(x) - 7 \frac{d}{dx} y(x) + 12 y(x) = 5 e^{2x} + x^2$  (16)
> CondIni := y(0) = 3, D(y)(0) = -6
      CondIni :=  $y(0) = 3, D(y)(0) = -6$  (17)
RESPUESTA
> with(inttrans)
[addtable, fourier, fouriercos, fouriersin, hankel, hilbert, invfourier, invhilbert, invlaplace,
 invmellin, laplace, mellin, savetable, setup] (18)
> EcuaTL := subs(CondIni, laplace(Ecua, x, s))
      EcuaTL :=  $s^2 \mathcal{L}(y(x), x, s) + 27 - 3s - 7s \mathcal{L}(y(x), x, s) + 12 \mathcal{L}(y(x), x, s) = \frac{5}{s-2} + \frac{2}{s^3}$  (19)
> SolPartTL := expand(isolate(EcuaTL, laplace(y(x), x, s)))
      SolPartTL :=  $\mathcal{L}(y(x), x, s) = \frac{5}{(s^2 - 7s + 12)(s - 2)} + \frac{2}{(s^2 - 7s + 12)s^3}$  (20)
      +  $\frac{3s}{s^2 - 7s + 12} - \frac{27}{s^2 - 7s + 12}$ 
> SolPartFinal := invlaplace(SolPartTL, s, x)
      SolPartFinal :=  $y(x) = \frac{5 e^{2x}}{2} + \frac{349 e^{3x}}{27} - \frac{399 e^{4x}}{32} + \frac{37}{864} + \frac{x^2}{12} + \frac{7x}{72}$  (21)
> ComprobarUno := simplify(subs(x=0, SolPartFinal))
      ComprobarUno :=  $y(0) = 3$  (22)
> CondIni[1]
       $y(0) = 3$  (23)
> ComprobarDos := D(y)(0) = rhs(simplify(subs(x=0, diff(SolPartFinal, x))))
      ComprobarDos :=  $D(y)(0) = -6$  (24)
> CondIni[2]
       $D(y)(0) = -6$  (25)
> Ecua
       $\frac{d^2}{dx^2} y(x) - 7 \frac{d}{dx} y(x) + 12 y(x) = 5 e^{2x} + x^2$  (26)
> ComprobarTres := simplify(eval(subs(y(x) = rhs(SolPartFinal), lhs(Ecua) - rhs(Ecua)
      = 0)))
      ComprobarTres :=  $0 = 0$  (27)
> dsolve(Ecua)
       $y(x) = e^{3x} c_2 + e^{4x} c_1 + \frac{5 e^{2x}}{2} + \frac{x^2}{12} + \frac{7x}{72} + \frac{37}{864}$  (28)
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