```
> restart
```

SERIE 3 SEMESTRE 2024-2

```
> restart
```

1a)

```
> f := Heaviside(t - 2)·t·exp(-2 t)
```

$$f := \text{Heaviside}(t-2)\, t\, e^{-2t} \tag{1}$$

```
> with(inttrans) :
> F := laplace(f, t, s)
```

$$F := \frac{(5+2s)\, e^{-4-2s}}{(2+s)^2} \tag{2}$$

```
>
```

1b)

```
> G := s·exp(-s)/(s^2 + s - 2)
```

$$G := \frac{s\, e^{-s}}{s^2+s-2} \tag{3}$$

```
> g := invlaplace(G, s, t)
```

$$g := \frac{\text{Heaviside}(t-1)\left(2\, e^{-2t+2} + e^{t-1}\right)}{3} \tag{4}$$

```
> restart
```

2) Obtenga la solución del sistema

```
> Sistema := 2·diff(x(t), t) + diff(y(t), t) - 2·x(t) = 1, diff(x(t), t) + diff(y(t), t) - 3·x(t)
      - 3·y(t) = 2 : Sistema[1]; Sistema[2]
```

$$2\frac{d}{dt}x(t) + \frac{d}{dt}y(t) - 2x(t) = 1$$

$$\frac{d}{dt}x(t) + \frac{d}{dt}y(t) - 3x(t) - 3y(t) = 2 \tag{5}$$

```
> CondIni := x(0) = 0, y(0) = 0
```

$$CondIni := x(0) = 0, y(0) = 0 \tag{6}$$

```
> Sist := Sistema[1] - Sistema[2], -Sistema[1] + 2·Sistema[2] : Sist[1]; Sist[2]
```

$$\frac{d}{dt}x(t) + x(t) + 3y(t) = -1$$

$$\frac{d}{dt}y(t) - 4x(t) - 6y(t) = 3 \tag{7}$$

```
> SistDos := lhs(Sist[1]) - (x(t) + 3 y(t)) = rhs(Sist[1]) - (x(t) + 3 y(t)), lhs(Sist[2]) - (
      - 4 x(t) - 6 y(t)) = rhs(Sist[2]) - ( - 4 x(t) - 6 y(t)) : SistDos[1]; SistDos[2]
```

$$\frac{d}{dt}x(t) = -1 - x(t) - 3y(t)$$

$$\frac{d}{dt}y(t) = 3 + 4x(t) + 6y(t) \tag{8}$$

```
> AA := array([[-1,-3],[4,6]])
```

$$AA := \begin{bmatrix} -1 & -3 \\ 4 & 6 \end{bmatrix} \tag{9}$$

```
> BB := array([-1,3])
```

$$BB := \begin{bmatrix} -1 & 3 \end{bmatrix} \tag{10}$$

```
> Xcero := array([0,0])
```

$$Xcero := \begin{bmatrix} 0 & 0 \end{bmatrix} \tag{11}$$

```
> with(linalg):
> MatExp := exponential(AA, t)
```

$$MatExp := \begin{bmatrix} 4\,e^{2t} - 3\,e^{3t} & -3\,e^{3t} + 3\,e^{2t} \\ 4\,e^{3t} - 4\,e^{2t} & -3\,e^{2t} + 4\,e^{3t} \end{bmatrix} \tag{12}$$

```
> SolHom := evalm(MatExp &* Xcero)
```

$$SolHom := \begin{bmatrix} 0 & 0 \end{bmatrix} \tag{13}$$

```
> MatExpTau := map(rcurry(eval, t='t - tau'), MatExp)
```

$$MatExpTau := \begin{bmatrix} 4\,e^{2t-2\tau} - 3\,e^{3t-3\tau} & -3\,e^{3t-3\tau} + 3\,e^{2t-2\tau} \\ 4\,e^{3t-3\tau} - 4\,e^{2t-2\tau} & -3\,e^{2t-2\tau} + 4\,e^{3t-3\tau} \end{bmatrix} \tag{14}$$

```
> BBtau := map(rcurry(eval, t='tau'), BB)
```

$$BBtau := \begin{bmatrix} -1 & 3 \end{bmatrix} \tag{15}$$

```
> ProdTau := evalm(MatExpTau &* BBtau)
```

$$ProdTau := \begin{bmatrix} 5\,e^{2t-2\tau} - 6\,e^{3t-3\tau} & 8\,e^{3t-3\tau} - 5\,e^{2t-2\tau} \end{bmatrix} \tag{16}$$

```
> SolNoHom := map(int, ProdTau, tau = 0..t)
```

$$SolNoHom := \begin{bmatrix} -\frac{1}{2} + \frac{5\,e^{2t}}{2} - 2\,e^{3t} & -\frac{1}{6} - \frac{5\,e^{2t}}{2} + \frac{8\,e^{3t}}{3} \end{bmatrix} \tag{17}$$

```
> SolPartFinal := evalm(SolHom + SolNoHom) : x(t) = SolPartFinal[1]; y(t) = SolPartFinal[2]
```

$$x(t) = -\frac{1}{2} + \frac{5\,e^{2t}}{2} - 2\,e^{3t}$$

$$y(t) = -\frac{1}{6} - \frac{5\,e^{2t}}{2} + \frac{8\,e^{3t}}{3} \tag{18}$$

```
> Sistema[1]; Sistema[2]
```

$$2\,\frac{d}{dt}x(t) + \frac{d}{dt}y(t) - 2\,x(t) = 1$$

$$\frac{d}{dt}x(t) + \frac{d}{dt}y(t) - 3\,x(t) - 3\,y(t) = 2 \tag{19}$$

```
> ComprobacionUno := eval(subs(x(t) = SolPartFinal[1], y(t) = SolPartFinal[2], Sistema[1]))
```

$$ComprobacionUno := 1 = 1 \tag{20}$$

```
> ComprobacionDos := eval(subs(x(t) = SolPartFinal[1], y(t) = SolPartFinal[2], Sistema[2]))
```

$$ComprobacionDos := 2 = 2 \quad (21)$$

```
> CondIniUno := simplify(subs(t = 0, x(t) = SolPartFinal[1]))
```

$$CondIniUno := x(0) = 0 \quad (22)$$

```
> CondIniDos := simplify(subs(t = 0, y(t) = SolPartFinal[2]))
```

$$CondIniDos := y(0) = 0 \quad (23)$$

```
> restart
```

3)

```
> Ecua := diff(y(t), t$2) + 6·diff(y(t), t) + 5·y(t) = Dirac(t − 1)·exp(t)
```

$$Ecua := \frac{d^2}{dt^2} y(t) + 6 \frac{d}{dt} y(t) + 5\, y(t) = \mathrm{Dirac}(t-1)\, e^{t} \quad (24)$$

```
> CondIni := y(0) = 0, D(y)(0) = 4
```

$$CondIni := y(0) = 0, D(y)(0) = 4 \quad (25)$$

```
> with(inttrans) :
> EcuaTL := subs(CondIni, laplace(Ecua, t, s))
```

$$EcuaTL := s^2 \mathcal{L}(y(t), t, s) - 4 + 6\, s\, \mathcal{L}(y(t), t, s) + 5\, \mathcal{L}(y(t), t, s) = e^{1-s} \quad (26)$$

```
> SolTL := isolate(EcuaTL, laplace(y(t), t, s))
```

$$SolTL := \mathcal{L}(y(t), t, s) = \frac{e^{1-s} + 4}{s^2 + 6\, s + 5} \quad (27)$$

```
> SolPart := invlaplace(SolTL, s, t)
```

$$SolPart := y(t) = \frac{\mathrm{Heaviside}(t-1)\, \sinh(2\, t - 2)\, e^{4-3\, t}}{2} + 2\, e^{-3\, t} \sinh(2\, t) \quad (28)$$

```
> Comprobacion := simplify(eval(subs(y(t) = rhs(SolPart), Ecua)))
```

$$Comprobacion := e\, \mathrm{Dirac}(t-1) = e\, \mathrm{Dirac}(t-1) \quad (29)$$

```
> ComprobarDos := y(0) = simplify( subs(t = 0, rhs(SolPart)))
```

$$ComprobarDos := y(0) = 0 \quad (30)$$

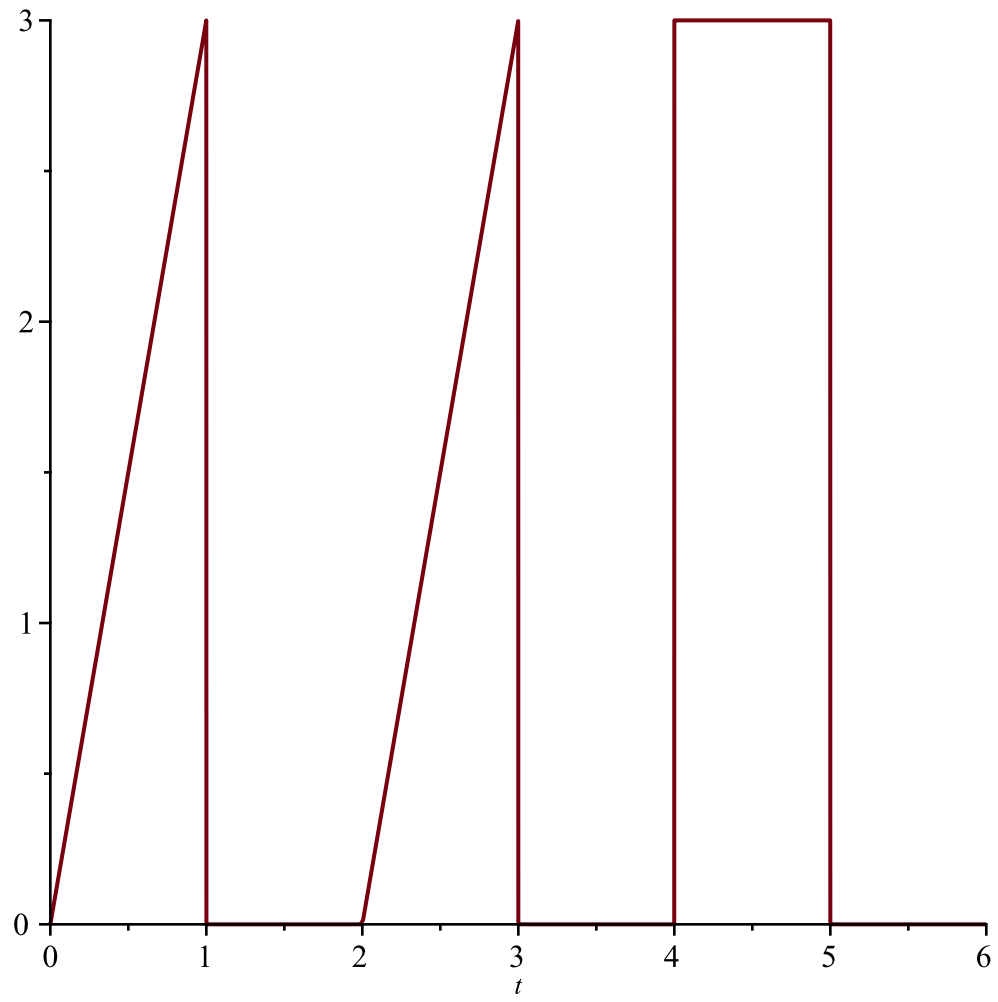
```
> ComprobarTres := D(y)(0) = simplify( subs(t = 0, rhs(diff(SolPart, t))))
```

$$ComprobarTres := D(y)(0) = 4 \quad (31)$$

```
> restart
```

4)

```
> f := 3·t·Heaviside(t) − 3·(t − 1)·Heaviside(t − 1) − 3·Heaviside(t − 1) + 3·(t − 2)
      ·Heaviside(t − 2) − 3·(t − 3)·Heaviside(t − 3) − 3·Heaviside(t − 3) + 3·Heaviside(t
      − 4) − 3·Heaviside(t − 5) : plot(f, t = 0..6)
```




```
> with(inttrans) :
> F := laplace(f, t, s)
```

$$F := \frac{3\left(1 - e^{-3s} + e^{-2s} - e^{-s}\right)}{s^2} - \frac{3\left(e^{-s} + e^{-5s} - e^{-4s} + e^{-3s}\right)}{s} \quad (32)$$

```
> restart
```

5)

```
> Ecua := diff(y(t), t$2) - 2·diff(y(t), t) - 8·y(t) = 6·exp(-2 t)
```

$$Ecua := \frac{d^2}{dt^2} y(t) - 2\frac{d}{dt} y(t) - 8\,y(t) = 6\,e^{-2t} \quad (33)$$

```
> CondIni := y(0) = 0, D(y)(0) = -7
```

$$CondIni := y(0) = 0, D(y)(0) = -7 \quad (34)$$

```
> with(inttrans) :
> EcuaTL := subs(CondIni, laplace(Ecua, t, s))
```

$$EcuaTL := s^2 \mathcal{L}(y(t), t, s) + 7 - 2s\,\mathcal{L}(y(t), t, s) - 8\,\mathcal{L}(y(t), t, s) = \frac{6}{s+2} \quad (35)$$

```
> SolTL := isolate(EcuaTL, laplace(y(t), t, s))
```

(36)

$$SolTL := \mathcal{L}(y(t), t, s) = \frac{\frac{6}{s+2} - 7}{s^2 - 2s - 8} \quad (36)$$

> $SolPart := invlaplace(SolTL, s, t)$

$$SolPart := y(t) = -e^{4t} - e^{-2t}(t-1) \quad (37)$$

>

5b) Convertir la ecuación a un sistema y resolverlo con matriz exponencial

> $Ecua := diff(y(t), t\$2) - 2\cdot diff(y(t), t) - 8\cdot y(t) = 6\cdot\exp(-2t)$

$$Ecua := \frac{d^2}{dt^2} y(t) - 2\frac{d}{dt} y(t) - 8y(t) = 6e^{-2t} \quad (38)$$

> $VarUno := y(t) = y[1](t)$

$$VarUno := y(t) = y_1(t) \quad (39)$$

> $Sist[1] := diff(y[1](t), t) = y[2](t)$

$$Sist_1 := \frac{d}{dt} y_1(t) = y_2(t) \quad (40)$$

> $Sist[2] := diff(y[2](t), t) = 8y[1](t) + 2\cdot y[2](t) + 6\cdot\exp(-2t)$

$$Sist_2 := \frac{d}{dt} y_2(t) = 8y_1(t) + 2y_2(t) + 6e^{-2t} \quad (41)$$

> $CondIni := y[1](0) = 0, y[2](0) = -7$

$$CondIni := y_1(0) = 0, y_2(0) = -7 \quad (42)$$

> $AA := array([[0, 1], [8, 2]])$

$$AA := \begin{bmatrix} 0 & 1 \\ 8 & 2 \end{bmatrix} \quad (43)$$

> $Xcero := array([0, -7])$

$$Xcero := \begin{bmatrix} 0 & -7 \end{bmatrix} \quad (44)$$

> $BB := array([0, 6\cdot\exp(-2t)])$

$$BB := \begin{bmatrix} 0 & 6e^{-2t} \end{bmatrix} \quad (45)$$

> $with(linalg):$

> $MatExp := exponential(AA, t)$

$$MatExp := \begin{bmatrix} \frac{2e^{-2t}}{3} + \frac{e^{4t}}{3} & \frac{e^{4t}}{6} - \frac{e^{-2t}}{6} \\ \frac{4e^{4t}}{3} - \frac{4e^{-2t}}{3} & \frac{e^{-2t}}{3} + \frac{2e^{4t}}{3} \end{bmatrix} \quad (46)$$

> $SolHom := evalm(MatExp \&* Xcero)$

$$SolHom := \begin{bmatrix} -\frac{7e^{4t}}{6} + \frac{7e^{-2t}}{6} & -\frac{7e^{-2t}}{3} - \frac{14e^{4t}}{3} \end{bmatrix} \quad (47)$$

> $SolHomCero := map(rcurry(eval, t='0'), SolHom)$

$$SolHomCero := \begin{bmatrix} 0 & -7 \end{bmatrix} \tag{48}$$

> $MatExpTau := map(rcurry(eval, t='t - tau'), MatExp)$

$$MatExpTau := \begin{bmatrix} \frac{2\,e^{-2t+2\tau}}{3} + \frac{e^{4t-4\tau}}{3} & \frac{e^{4t-4\tau}}{6} - \frac{e^{-2t+2\tau}}{6} \\ \frac{4\,e^{4t-4\tau}}{3} - \frac{4\,e^{-2t+2\tau}}{3} & \frac{e^{-2t+2\tau}}{3} + \frac{2\,e^{4t-4\tau}}{3} \end{bmatrix} \tag{49}$$

> $BBtau := map(rcurry(eval, t='tau'), BB)$

$$BBtau := \begin{bmatrix} 0 & 6\,e^{-2\tau} \end{bmatrix} \tag{50}$$

> $ProdTau := simplify(evalm(MatExpTau \&* BBtau))$

$$ProdTau := \begin{bmatrix} \left(e^{4t-4\tau} - e^{-2t+2\tau}\right) e^{-2\tau} & 2\left(e^{-2t+2\tau} + 2\,e^{4t-4\tau}\right) e^{-2\tau} \end{bmatrix} \tag{51}$$

> $SolNoHom := map(int, ProdTau, tau = 0..t)$

$$SolNoHom := \begin{bmatrix} \frac{e^{4t}}{6} - \frac{e^{-2t}}{6} - t\,e^{-2t} & \frac{2\,e^{4t}}{3} + 2\,t\,e^{-2t} - \frac{2\,e^{-2t}}{3} \end{bmatrix} \tag{52}$$

> $SolPartFinal := evalm(SolHom + SolNoHom) : y[1](t) = SolPartFinal[1]; y[2](t) = SolPartFinal[2]$

$$y_1(t) = -e^{4t} + e^{-2t} - t\,e^{-2t}$$

$$y_2(t) = -3\,e^{-2t} - 4\,e^{4t} + 2\,t\,e^{-2t} \tag{53}$$

> $simplify(SolPart)$

$$y(t) = -e^{4t} + e^{-2t} - t\,e^{-2t} \tag{54}$$

> $restart$

6)

> $Ecua := diff(y(t), t\$2) - 4 \cdot diff(y(t), t) + 6 \cdot y(t) = 30 \cdot \text{Heaviside}(t - \text{Pi})$

$$Ecua := \frac{d^2}{dt^2} y(t) - 4 \frac{d}{dt} y(t) + 6\,y(t) = 30\,\text{Heaviside}(t - \pi) \tag{55}$$

> $CondIni := y(0) = 0, D(y)(0) = 0$

$$CondIni := y(0) = 0, D(y)(0) = 0 \tag{56}$$

> $with(inttrans) :$

> $EcuaTL := subs(CondIni, laplace(Ecua, t, s))$

$$EcuaTL := s^2 \mathcal{L}(y(t), t, s) - 4\,s\,\mathcal{L}(y(t), t, s) + 6\,\mathcal{L}(y(t), t, s) = \frac{30\,e^{-s\pi}}{s} \tag{57}$$

> $SolTL := isolate(EcuaTL, laplace(y(t), t, s))$

$$SolTL := \mathcal{L}(y(t), t, s) = \frac{30\,e^{-s\pi}}{s\left(s^2 - 4\,s + 6\right)} \tag{58}$$

> $SolPart := invlaplace(SolTL, s, t)$

$$SolPart := y(t) = 5\,\text{Heaviside}(t - \pi)\left(1 + \left(\sin\left(\sqrt{2}\,(t - \pi)\right)\sqrt{2} - \cos\left(\sqrt{2}\,(t - \pi)\right)\right)e^{-2\pi + 2t}\right) \tag{59}$$

> *Ecua*

$$\frac{d^2}{dt^2} y(t) - 4 \frac{d}{dt} y(t) + 6\, y(t) = 30\ \text{Heaviside}(t - \pi) \tag{60}$$

> *Comprobacion* := *simplify*(*eval*(*subs*(*y*(*t*) = *rhs*(*SolPart*), *Ecua*)))

$$\textit{Comprobacion} := 30\ \text{Heaviside}(t - \pi) = 30\ \text{Heaviside}(t - \pi) \tag{61}$$

> *restart*

7)

> *Ecua* := *diff*(*y*(*t*), *t*$2) − 2·*diff*(*y*(*t*), *t*) + 5·*y*(*t*) = 8·exp(*t*)

$$\textit{Ecua} := \frac{d^2}{dt^2} y(t) - 2 \frac{d}{dt} y(t) + 5\, y(t) = 8\, e^t \tag{62}$$

> *CondIni* := *y*(0) = 2, D(*y*)(0) = 12

$$\textit{CondIni} := y(0) = 2,\ D(y)(0) = 12 \tag{63}$$

> *with*(*inttrans*) :

> *EcuaTL* := *subs*(*CondIni*, *laplace*(*Ecua*, *t*, *s*))

$$\textit{EcuaTL} := s^2\, \mathcal{L}(y(t), t, s) - 8 - 2\, s - 2\, s\, \mathcal{L}(y(t), t, s) + 5\, \mathcal{L}(y(t), t, s) = \frac{8}{s - 1} \tag{64}$$

> *SolTL* := *isolate*(*EcuaTL*, *laplace*(*y*(*t*), *t*, *s*))

$$\textit{SolTL} := \mathcal{L}(y(t), t, s) = \frac{\frac{8}{s - 1} + 2\, s + 8}{s^2 - 2\, s + 5} \tag{65}$$

> *SolPart* := *invlaplace*(*SolTL*, *s*, *t*)

$$\textit{SolPart} := y(t) = (2 + 5 \sin(2\, t))\, e^t \tag{66}$$

> *Comprobacion* := *simplify*(*eval*(*subs*(*y*(*t*) = *rhs*(*SolPart*), *Ecua*)))

$$\textit{Comprobacion} := 8\, e^t = 8\, e^t \tag{67}$$

> *CondicionUno* := *y*(0) = *simplify*(*subs*(*t* = 0, *rhs*(*SolPart*)))

$$\textit{CondicionUno} := y(0) = 2 \tag{68}$$

> *CondicionDos* := D(*y*)(0) = *simplify*(*subs*(*t* = 0, *rhs*(*diff*(*SolPart*, *t*))))

$$\textit{CondicionDos} := D(y)(0) = 12 \tag{69}$$

> *Ecua*

$$\frac{d^2}{dt^2} y(t) - 2 \frac{d}{dt} y(t) + 5\, y(t) = 8\, e^t \tag{70}$$

> *CondIni*

$$y(0) = 2,\ D(y)(0) = 12 \tag{71}$$

7b)

> *SistemaUno* := *diff*(*y*[1](*t*), *t*) = *y*[2](*t*)

$$\textit{SistemaUno} := \frac{d}{dt} y_1(t) = y_2(t) \tag{72}$$

> *SistemaDos* := *diff*(*y*[2](*t*), *t*) = −5·*y*[1](*t*) + 2·*y*[2](*t*) + 8·exp(*t*)

$$\textit{SistemaDos} := \frac{d}{dt} y_2(t) = -5\, y_1(t) + 2\, y_2(t) + 8\, e^t \tag{73}$$

> $AA := array([[0, 1], [-5, 2]])$

$$AA := \begin{bmatrix} 0 & 1 \\ -5 & 2 \end{bmatrix} \tag{74}$$

> $Xcero := array([2, 12])$

$$Xcero := \begin{bmatrix} 2 & 12 \end{bmatrix} \tag{75}$$

> $BB := array([0, 8 \cdot \exp(t)])$

$$BB := \begin{bmatrix} 0 & 8\,e^{t} \end{bmatrix} \tag{76}$$

> $with(linalg) :$

> $MatExp := exponential(AA, t)$

$$MatExp := \begin{bmatrix} \cos(2\,t)\,e^{t} - \frac{\sin(2\,t)\,e^{t}}{2} & \frac{\sin(2\,t)\,e^{t}}{2} \\ -\frac{5\sin(2\,t)\,e^{t}}{2} & \cos(2\,t)\,e^{t} + \frac{\sin(2\,t)\,e^{t}}{2} \end{bmatrix} \tag{77}$$

> $SolHom := evalm(MatExp \&* Xcero) : y[1](t) = SolHom[1]$

$$y_1(t) = 2\cos(2\,t)\,e^{t} + 5\sin(2\,t)\,e^{t} \tag{78}$$

> $MatExpTau := map(rcurry(eval, t = 't - tau'), MatExp)$

$$MatExpTau := \begin{bmatrix} \cos(2\,t - 2\,\tau)\,e^{t-\tau} - \frac{\sin(2\,t - 2\,\tau)\,e^{t-\tau}}{2} & \frac{\sin(2\,t - 2\,\tau)\,e^{t-\tau}}{2} \\ -\frac{5\sin(2\,t - 2\,\tau)\,e^{t-\tau}}{2} & \cos(2\,t - 2\,\tau)\,e^{t-\tau} + \frac{\sin(2\,t - 2\,\tau)\,e^{t-\tau}}{2} \end{bmatrix} \tag{79}$$

> $BBtau := map(rcurry(eval, t = 'tau'), BB)$

$$BBtau := \begin{bmatrix} 0 & 8\,e^{\tau} \end{bmatrix} \tag{80}$$

> $ProdTau := evalm(MatExpTau \&* BBtau)$

$$ProdTau := \begin{bmatrix} 4\sin(2\,t - 2\,\tau)\,e^{t-\tau}e^{\tau} & 8\left(\cos(2\,t - 2\,\tau)\,e^{t-\tau} + \frac{\sin(2\,t - 2\,\tau)\,e^{t-\tau}}{2}\right)e^{\tau} \end{bmatrix} \tag{81}$$

> $SolNoHom := simplify(map(int, ProdTau, tau = 0..t))$

$$SolNoHom := \begin{bmatrix} 4\sin(t)^2\,e^{t} & 4\sin(t)\,(\sin(t) + 2\cos(t))\,e^{t} \end{bmatrix} \tag{82}$$

> $SolPartFinal := simplify(evalm(SolHom + SolNoHom))$

$$SolPartFinal := \begin{bmatrix} 2\,e^{t} + 10\,e^{t}\sin(t)\cos(t) & 2\left(5\sin(t)\cos(t) + 10\cos(t)^2 - 4\right)e^{t} \end{bmatrix} \tag{83}$$

> $y[1](t) = SolPartFinal[1]$

$$y_1(t) = 2\,e^{t} + 10\,e^{t}\sin(t)\cos(t) \tag{84}$$

> $expand(SolPart)$

$$y(t) = 2\,e^{t} + 10\,e^{t}\sin(t)\cos(t) \tag{85}$$

> $y[2](t) = expand(SolPartFinal[2])$

$$y_2(t) = 10\,e^{t}\sin(t)\cos(t) + 20\,e^{t}\cos(t)^2 - 8\,e^{t} \quad (86)$$

> $CondUno := y[1](0) = simplify(subs(t=0, SolPartFinal[1]))$

$$CondUno := y_1(0) = 2 \quad (87)$$

> $ConmdDos := y[2](0) = simplify(subs(t=0, SolPartFinal[2]))$

$$ConmdDos := y_2(0) = 12 \quad (88)$$

> $CondIni$

$$y(0) = 2,\ D(y)(0) = 12 \quad (89)$$

> $restart$

8)

> $h := \exp(t)\cdot \mathrm{Heaviside}(t - \mathrm{Pi})$

$$h := e^{t}\,\mathrm{Heaviside}(t - \pi) \quad (90)$$

> $with(inttrans):$

> $H := laplace(h, t, s)$

$$H := \frac{e^{-\pi(s-1)}}{s-1} \quad (91)$$

> $restart$

9a) Obtenga

> $f := t\cdot \mathrm{Dirac}(t-1) + \mathrm{Heaviside}(t-3)$

$$f := t\,\mathrm{Dirac}(t-1) + \mathrm{Heaviside}(t-3) \quad (92)$$

> $with(inttrans):$

> $F := laplace(f, t, s)$

$$F := e^{-s} + \frac{e^{-3s}}{s} \quad (93)$$

> $G := \frac{s\cdot\exp(-3s)}{(s^2+4s+5)}$

$$G := \frac{s\,e^{-3s}}{s^2+4s+5} \quad (94)$$

> $g := invlaplace(G, s, t)$

$$g := \mathrm{Heaviside}(t-3)\,e^{-2t+6}\,(\cos(t-3) - 2\sin(t-3)) \quad (95)$$

> $restart$

FINAL SERIE 3

>