

```
> restart
> Ecua := diff(y(t), t$2) + diff(y(t), t) + y(t) = exp(2*t) + cos(4*t)
      Ecua :=  $\frac{d^2}{dt^2} y(t) + \frac{d}{dt} y(t) + y(t) = e^{2t} + \cos(4t)$  (1)
```

```
> CondIni := y(0) = 2, D(y)(0) = -3
      CondIni :=  $y(0) = 2, D(y)(0) = -3$  (2)
```

RESPUESTA

```
> with(inttrans) :
> EcuaTL := subs(CondIni, laplace(Ecua, t, s))
      EcuaTL :=  $s^2 \mathcal{L}(y(t), t, s) + 1 - 2s + s \mathcal{L}(y(t), t, s) + \mathcal{L}(y(t), t, s) = \frac{1}{s-2} + \frac{s}{s^2+16}$  (3)
```

```
> SolTL := laplace(y(t), t, s) = expand(rhs(isolate(EcuaTL, laplace(y(t), t, s))))
      SolTL :=  $\mathcal{L}(y(t), t, s) = \frac{1}{(s^2+s+1)(s-2)} + \frac{s}{(s^2+s+1)(s^2+16)} + \frac{2s}{s^2+s+1}$  (4)
       $-\frac{1}{s^2+s+1}$ 
```

```
> SolPart := simplify(invlaplace(SolTL, s, t)); evalf(%, 3)
      SolPart :=  $y(t) = -\frac{8072 \sin\left(\frac{\sqrt{3}}{2}t\right) e^{-\frac{t}{2}} \sqrt{3}}{5061} + \frac{3238 \cos\left(\frac{\sqrt{3}}{2}t\right) e^{-\frac{t}{2}}}{1687} - \frac{15 \cos(4t)}{241}$ 
       $+ \frac{4 \sin(4t)}{241} + \frac{e^{2t}}{7}$ 
       $y(t) = -2.75 \sin(0.865t) e^{-0.500t} + 1.92 \cos(0.865t) e^{-0.500t} - 0.0622 \cos(4t)$ 
       $+ 0.0166 \sin(4t) + 0.143 e^{2t}$  (5)
```

```
> Ecua
       $\frac{d^2}{dt^2} y(t) + \frac{d}{dt} y(t) + y(t) = e^{2t} + \cos(4t)$  (6)
```

```
> Comprobar := simplify(eval(subs(y(t) = rhs(SolPart), lhs(Ecua) - rhs(Ecua) = 0)))
      Comprobar :=  $0 = 0$  (7)
```

```
>
```