> *restart*

> $simplify\left(\dfrac{1}{2} \cdot \sin(2 \cdot t) \cdot int(\cos(2 \cdot tau)^2, tau = 0 ..t) - \dfrac{1}{2} \cdot \cos(2 \cdot t) \cdot int(\cos(2 \cdot tau) \cdot \sin(2 \cdot tau),\right.$

$\left. tau = 0 ..t) \right)$

$$\frac{t \sin(2 t)}{4} \tag{1}$$

> $F := \dfrac{s}{\left(s^2 + 4\right)^2}$

$$F := \frac{s}{\left(s^2 + 4\right)^2} \tag{2}$$

> $with(inttrans):$

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

$$f := \frac{t \sin(2 t)}{4} \tag{3}$$

> *restart*

> $Ecua := diff(y(t), t\$2) - 3\ diff(y(t), t) + 2\ y(t) = 4\ t^2 \cdot \exp(2\ t)$

$$Ecua := \frac{d^2}{dt^2} y(t) - 3 \frac{d}{dt} y(t) + 2 y(t) = 4 t^2 e^{2t} \tag{4}$$

> $CondIni := y(0) = -3, D(y)(0) = 5$

$$CondIni := y(0) = -3, D(y)(0) = 5 \tag{5}$$

> $with(inttrans):$

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

$$EcuaTL := s^2 \mathcal{L}(y(t), t, s) - 14 + 3 s - 3 s \mathcal{L}(y(t), t, s) + 2 \mathcal{L}(y(t), t, s) = \frac{8}{(s-2)^3} \tag{6}$$

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

$$SolTL := \mathcal{L}(y(t), t, s) = \frac{8}{\left(s^2 - 3 s + 2\right)(s - 2)^3} - \frac{3 s}{s^2 - 3 s + 2} + \frac{14}{s^2 - 3 s + 2} \tag{7}$$

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

$$SolPart := y(t) = -3 e^t + \frac{4 \left(e^t\right)^2 t^3}{3} - 4 \left(e^t\right)^2 t^2 + 8 \left(e^t\right)^2 t \tag{8}$$

> $Comprobar := simplify(eval(subs(y(t) = rhs(SolPart), Ecua)))$

$$Comprobar := 4 t^2 e^{2t} = 4 t^2 e^{2t} \tag{9}$$

>