```
> restart
> Ecuacion := diff(y(t), t$2) = -gravedad
```

$$Ecuacion := \frac{d^2}{dt^2} y(t) = -gravedad \tag{1}$$

```
> Solucion := dsolve(Ecuacion)
```

$$Solucion := y(t) = -\frac{1}{2} gravedad\ t^2 + \_C1\ t + \_C2 \tag{2}$$

```
> DerivadaSolucion := diff(Solucion, t)
```

$$DerivadaSolucion := \frac{d}{dt} y(t) = -t\ gravedad + \_C1 \tag{3}$$

```
> DerivadaSegundaSolucion := diff(DerivadaSolucion, t)
```

$$DerivadaSegundaSolucion := \frac{d^2}{dt^2} y(t) = -gravedad \tag{4}$$

```
> ComprobacionUno := eval(subs(y(t) = rhs(Solucion), lhs(Ecuacion) - rhs(Ecuacion) = 0))
```

$$ComprobacionUno := 0 = 0 \tag{5}$$

```
> restart
> Ecua := diff(y(x), x$2) + 8·diff(y(x), x) + 16·y(x) = 5·exp(3·x)
```

$$Ecua := \frac{d^2}{dx^2} y(x) + 8\left(\frac{d}{dx} y(x)\right) + 16\ y(x) = 5\ e^{3x} \tag{6}$$

```
> Solucion := dsolve(Ecua)
```

$$Solucion := y(x) = e^{-4x}\_C2 + e^{-4x}x\_C1 + \frac{5}{49}\ e^{3x} \tag{7}$$

```
> Comprobacion := eval(subs(y(x) = rhs(Solucion), lhs(Ecua) - rhs(Ecua) = 0))
```

$$Comprobacion := 0 = 0 \tag{8}$$

```
> restart
> SolucionGeneral := y(x) = C[1]·exp(2·x) + C[2]·exp(-2·x)
```

$$SolucionGeneral := y(x) = C_1\ e^{2x} + C_2\ e^{-2x} \tag{9}$$

```
> DerSolGral := diff(SolucionGeneral, x)
```

$$DerSolGral := \frac{d}{dx} y(x) = 2\ C_1\ e^{2x} - 2\ C_2\ e^{-2x} \tag{10}$$

```
> DerSegSolGral := diff(SolucionGeneral, x$2)
```

$$DerSegSolGral := \frac{d^2}{dx^2} y(x) = 4\ C_1\ e^{2x} + 4\ C_2\ e^{-2x} \tag{11}$$

```
> Sist := DerSolGral, DerSegSolGral : Sist[1]; Sist[2]
```

$$\frac{d}{dx} y(x) = 2\ C_1\ e^{2x} - 2\ C_2\ e^{-2x}$$

$$\frac{d^2}{dx^2} y(x) = 4\ C_1\ e^{2x} + 4\ C_2\ e^{-2x} \tag{12}$$

```
> Const := C[1], C[2]
```

$$Const := C_1, C_2 \tag{13}$$

```
> Param := solve({Sist}, {C[1], C[2]}) : Param[1]; Param[2]
```

$$C_1 = \frac{1}{8} \; \frac{\dfrac{d^2}{dx^2} \, y(x) + 2 \left(\dfrac{d}{dx} \, y(x) \right)}{e^{2x}}$$

$$C_2 = -\frac{1}{8} \; \frac{-\left(\dfrac{d^2}{dx^2} \, y(x) \right) + 2 \left(\dfrac{d}{dx} \, y(x) \right)}{e^{-2x}} \tag{14}$$

> $EcuaUno := subs(C[1] = rhs(Param[1]), C[2] = rhs(Param[2]), SolucionGeneral)$

$$EcuaUno := y(x) = \frac{1}{4} \; \frac{d^2}{dx^2} \, y(x) \tag{15}$$

> $EcuacionDiferencial := rhs(EcuaUno) \cdot 4 - lhs(EcuaUno) \cdot 4 = 0$

$$EcuacionDiferencial := \frac{d^2}{dx^2} \, y(x) - 4 \, y(x) = 0 \tag{16}$$

> $SolucionGeneral$

$$y(x) = C_1 \, e^{2x} + C_2 \, e^{-2x} \tag{17}$$

> $restart$
>
>
>
>
>