```
> restart
> Ecua := y''-2*y'+2*y=5*exp(2*x)
```

$$Ecua := \frac{d^2}{dx^2} y(x) - 2\left(\frac{d}{dx} y(x)\right) + 2\,y(x) = 5\,e^{2x} \quad (1)$$

```
> EcuaHom := lhs(Ecua)=0
```

$$EcuaHom := \frac{d^2}{dx^2} y(x) - 2\left(\frac{d}{dx} y(x)\right) + 2\,y(x) = 0 \quad (2)$$

```
> Q := rhs(Ecua)
```

$$Q := 5\,e^{2x} \quad (3)$$

```
> SolHom := dsolve(EcuaHom)
```

$$SolHom := y(x) = \_C1\,e^{x}\sin(x) + \_C2\,e^{x}\cos(x) \quad (4)$$

```
> Comprobar := simplify(eval(subs(y(x)=rhs(SolHom), EcuaHom)))
```

$$Comprobar := 0 = 0 \quad (5)$$

```
> SolQ := A*exp(2*x)
```

$$SolQ := A\,e^{2x} \quad (6)$$

```
> CalcFx := simplify(eval(subs(y(x)=SolQ, Ecua)))
```

$$CalcFx := 2\,A\,e^{2x} = 5\,e^{2x} \quad (7)$$

```
> Para := A=solve(CalcFx, A)
```

$$Para := A = \frac{5}{2} \quad (8)$$

```
> F := subs(A=rhs(Para), SolQ)
```

$$F := \frac{5}{2}\,e^{2x} \quad (9)$$

```
> SolGralNoHom := y(x)=rhs(SolHom)+F
```

$$SolGralNoHom := y(x) = \_C1\,e^{x}\sin(x) + \_C2\,e^{x}\cos(x) + \frac{5}{2}\,e^{2x} \quad (10)$$

```
> ComprobarDos := simplify(eval(subs(y(x)=rhs(SolGralNoHom), lhs(Ecua)-rhs(Ecua)
      =0)))
```

$$ComprobarDos := 0 = 0 \quad (11)$$

```
> Cond := y(0)=4, D(y)(0)=-3
```

$$Cond := y(0) = 4,\ D(y)(0) = -3 \quad (12)$$

```
> SolPart := dsolve({Ecua, Cond})
```

$$SolPart := y(x) = -\frac{19}{2}\,e^{x}\sin(x) + \frac{3}{2}\,e^{x}\cos(x) + \frac{5}{2}\,e^{2x} \quad (13)$$

```
>
> CondicionUno := simplify(subs(x=0, rhs(SolGralNoHom)=4))
```

$$CondicionUno := \_C2 + \frac{5}{2} = 4 \quad (14)$$

```
> CondicionDos := simplify(subs(x=0, rhs(diff(SolGralNoHom, x))=-3))
```

$$CondicionDos := \_C1 + \_C2 + 5 = -3 \quad (15)$$

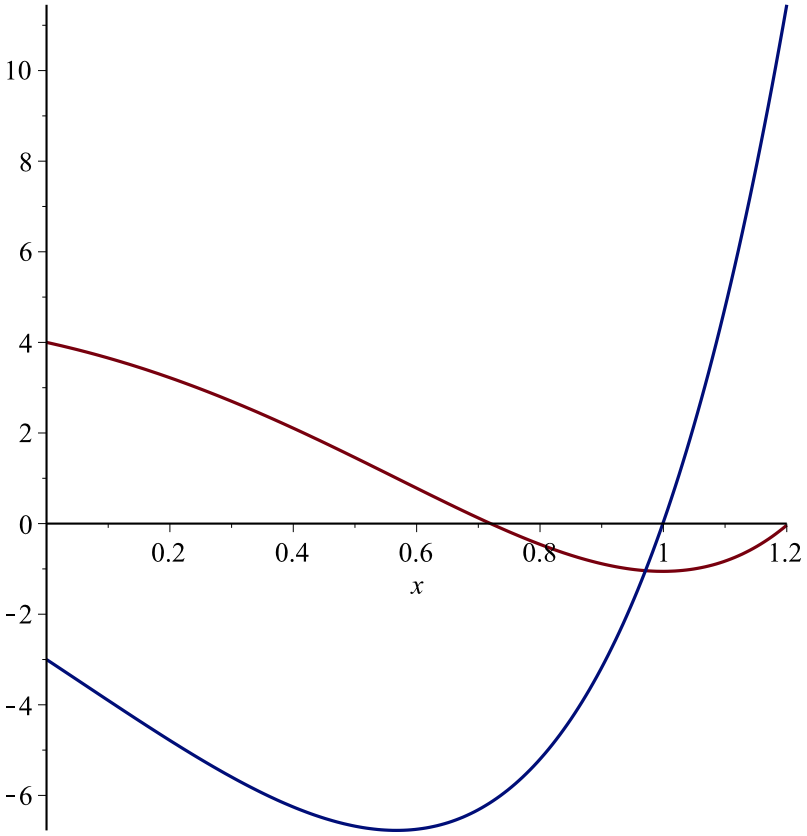
```
> ParaDos := solve({CondicionUno, CondicionDos}, {_C1, _C2})
```

$$ParaDos := \left\{\_C1 = -\frac{19}{2},\ \_C2 = \frac{3}{2}\right\} \quad (16)$$

```
> SolPart := subs(_C1 = rhs(ParaDos[1]), _C2 = rhs(ParaDos[2]), SolGralNoHom)
```

$$SolPart := y(x) = -\frac{19}{2}\, e^{x} \sin(x) + \frac{3}{2}\, e^{x} \cos(x) + \frac{5}{2}\, e^{2x} \tag{17}$$

```
> plot([rhs(SolPart), rhs(diff(SolPart, x))], x = 0..1.2)
```




```
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