```
> restart
```

EDO(2)L.cc.H: CASO I

```
> Ecuacion := diff(y(x), x$2) - 5·diff(y(x), x) + 6·y(x) = 0
```

$$Ecuacion := \frac{d^2}{dx^2} y(x) - 5\left(\frac{d}{dx} y(x)\right) + 6\,y(x) = 0 \quad (1)$$

```
> EcuacionCaracteristica := m··2 - 5 m + 6 = 0
```

$$EcuacionCaracteristica := m^2 - 5\,m + 6 = 0 \quad (2)$$

```
> Raiz := solve(EcuacionCaracteristica)
```

$$Raiz := 3, 2 \quad (3)$$

```
> Solucion_1 := y(x) = exp(Raiz_1·x); Solucion_2 := y(x) = exp(Raiz_2·x)
```

$$Solucion_1 := y(x) = e^{3x}$$

$$Solucion_2 := y(x) = e^{2x} \quad (4)$$

```
> with(linalg) :
> WW := wronskian([rhs(Solucion_1), rhs(Solucion_2)], x)
```

$$WW := \begin{bmatrix} e^{3x} & e^{2x} \\ 3\,e^{3x} & 2\,e^{2x} \end{bmatrix} \quad (5)$$

```
> comprobacion_1 := det(WW) ≠ 0;
```

$$comprobacion_1 := -e^{3x} e^{2x} \neq 0 \quad (6)$$

```
> SolucionGeneral := y(x) = C1·rhs(Solucion_1) + C2·rhs(Solucion_2)
```

$$SolucionGeneral := y(x) = C1\,e^{3x} + C2\,e^{2x} \quad (7)$$

```
> comprobacion_2 := subs(y(x) = rhs(SolucionGeneral), Ecuacion)
```

$$comprobacion_2 := \frac{\partial^2}{\partial x^2}\left(C1\,e^{3x} + C2\,e^{2x}\right) - 5\left(\frac{\partial}{\partial x}\left(C1\,e^{3x} + C2\,e^{2x}\right)\right) + 6\,C1\,e^{3x} + 6\,C2\,e^{2x} = 0 \quad (8)$$

```
> comprobacion_3 := eval(%)
```

$$comprobacion_3 := 0 = 0 \quad (9)$$

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

$$SolGral := y(x) = \_C1\,e^{3x} + \_C2\,e^{2x} \quad (10)$$

```
> SolucionGeneral;
```

$$y(x) = C1\,e^{3x} + C2\,e^{2x} \quad (11)$$

```
> Sistema := diff(SolucionGeneral, x), diff(SolucionGeneral, x$2) : Sistema_1; Sistema_2;
```

$$\frac{d}{dx} y(x) = 3\,C1\,e^{3x} + 2\,C2\,e^{2x}$$

$$\frac{d^2}{dx^2} y(x) = 9\,C1\,e^{3x} + 4\,C2\,e^{2x} \quad (12)$$

```
> Parametro := solve({Sistema}, {C1, C2})
```

$$Parametro := \left\{ C1 = \frac{1}{3}\,\frac{\frac{d^2}{dx^2}y(x) - 2\left(\frac{d}{dx}y(x)\right)}{e^{3x}},\ C2 = -\frac{1}{2}\,\frac{\frac{d^2}{dx^2}y(x) - 3\left(\frac{d}{dx}y(x)\right)}{e^{2x}} \right\} \quad (13)$$

```
> EcuacionIntermedia := subs(C1 = rhs(Parametro[1]), C2 = rhs(Parametro[2]),
      SolucionGeneral)
```

$$EcuacionIntermedia := y(x) = -\frac{1}{6}\,\frac{d^2}{dx^2}y(x) + \frac{5}{6}\,\frac{d}{dx}y(x) \quad (14)$$

```
> EcuacionOriginal := lhs(EcuacionIntermedia)·6 − rhs(EcuacionIntermedia)·6 = 0
```

$$EcuacionOriginal := \frac{d^2}{dx^2}y(x) - 5\left(\frac{d}{dx}y(x)\right) + 6\,y(x) = 0 \quad (15)$$

```
> Ecuacion
```

$$\frac{d^2}{dx^2}y(x) - 5\left(\frac{d}{dx}y(x)\right) + 6\,y(x) = 0 \quad (16)$$

```
> restart
```

TEOREMA DE EULER

```
> exp(Pi·I) + 1 = 0
```

$$0 = 0 \quad (17)$$

```
> restart
```

CASO III

```
> Ecuacion := diff(y(x), x$2) − 2·diff(y(x), x) + 2 y(x) = 0
```

$$Ecuacion := \frac{d^2}{dx^2}y(x) - 2\left(\frac{d}{dx}y(x)\right) + 2\,y(x) = 0 \quad (18)$$

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

$$Solucion := y(x) = \_C1\ e^{x}\sin(x) + \_C2\ e^{x}\cos(x) \quad (19)$$

```
> EcCarac := m··2 − 2 m + 2 = 0;
```

$$EcCarac := m^2 - 2\,m + 2 = 0 \quad (20)$$

```
> Raiz := solve(EcCarac)
```

$$Raiz := 1 + I,\ 1 - I \quad (21)$$

```
>
>
>
```