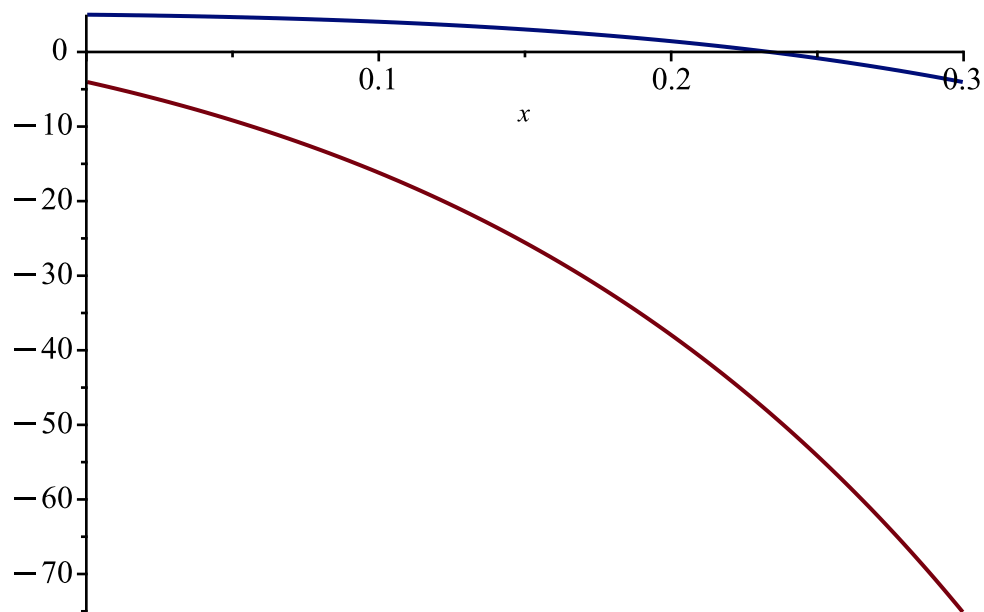


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> restart
> Ecua := y'' - 7·y' + 12·y = 0
      Ecua :=  $\frac{d^2}{dx^2} y(x) - 7 \frac{d}{dx} y(x) + 12 y(x) = 0$  (1)
> EcuaCarac := m2 - 7·m + 12 = 0
      EcuaCarac :=  $m^2 - 7 m + 12 = 0$  (2)
> Raiz := solve(EcuaCarac)
      Raiz := 4, 3 (3)
> yy[1] := exp(Raiz[1]·x)
      yy1 := e4x (4)
> yy[2] := exp(Raiz[2]·x)
      yy2 := e3x (5)
> SolGral := y(x) = _C1·yy[1] + _C2·yy[2]
      SolGral :=  $y(x) = \_C1 e^{4x} + \_C2 e^{3x}$  (6)
> Comprobar := eval(subs(y(x) = rhs(SolGral), Ecua))
      Comprobar := 0 = 0 (7)
> CondIni := y(0) = 5, D(y)(0) = -4
      CondIni :=  $y(0) = 5, D(y)(0) = -4$  (8)
> EcuaUno := simplify(subs(x=0, rhs(SolGral) = 5))
      EcuaUno :=  $\_C1 + \_C2 = 5$  (9)
> EcuaDos := simplify(subs(x=0, rhs(diff(SolGral, x)) = -4))
      EcuaDos :=  $4 \_C1 + 3 \_C2 = -4$  (10)
> Para := solve({EcuaUno, EcuaDos}, {_C1, _C2})
      Para := {_C1 = -19, _C2 = 24} (11)
> SolPart := subs(_C1 = rhs(Para[1]), _C2 = rhs(Para[2]), SolGral)
      SolPart :=  $y(x) = -19 e^{4x} + 24 e^{3x}$  (12)
> plot({rhs(SolPart), rhs(diff(SolPart, x))}, x=0..0.3)

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> SolGral

$$y(x) = \_C1 e^{4x} + \_C2 e^{3x} \quad (13)$$

> SolPart

$$y(x) = -19 e^{4x} + 24 e^{3x} \quad (14)$$

> DerSolPart := diff(SolPart, x)

$$DerSolPart := \frac{d}{dx} y(x) = -76 e^{4x} + 72 e^{3x} \quad (15)$$

> CondIni

$$y(0) = 5, D(y)(0) = -4 \quad (16)$$

> with(linalg) :

> WW := wronskian([yy[1], yy[2]], x)

$$WW := \begin{bmatrix} e^{4x} & e^{3x} \\ 4e^{4x} & 3e^{3x} \end{bmatrix} \quad (17)$$

> DetWW := det(WW)

$$DetWW := -e^{4x} e^{3x} \quad (18)$$

> WWW := wronskian([5·yy[1], -12·yy[1]], x)

$$WWW := \begin{bmatrix} 5e^{4x} & -12e^{4x} \\ 20e^{4x} & -48e^{4x} \end{bmatrix} \quad (19)$$

> DetWWW := det(WWW)

$$DetWWW := 0 \quad (20)$$

> restart

> Ecua := y''' - y'' - 14·y' + 24·y = 0

$$Ecua := \frac{d^3}{dx^3} y(x) - \frac{d^2}{dx^2} y(x) - 14 \frac{d}{dx} y(x) + 24 y(x) = 0 \quad (21)$$

$$\begin{aligned} &> \text{SolGral} := \text{dsolve}(\text{Ecua}) \\ &\quad \text{SolGral} := y(x) = c_1 e^{2x} + c_2 e^{3x} + c_3 e^{-4x} \end{aligned} \quad (22)$$

$$\begin{aligned} &> \text{CondIni} := y(0) = 2, D(y)(0) = -3, D(D(y))(0) = 5 \\ &\quad \text{CondIni} := y(0) = 2, D(y)(0) = -3, D^{(2)}(y)(0) = 5 \end{aligned} \quad (23)$$

$$\begin{aligned} &> \text{SolPart} := \text{expand}(\text{dsolve}(\{\text{CondIni}, \text{Ecua}\})) \\ &\quad \text{SolPart} := y(x) = \frac{11 (e^x)^2}{3} - \frac{17 (e^x)^3}{7} + \frac{16}{21 (e^x)^4} \end{aligned} \quad (24)$$

$$\begin{aligned} &> \text{evalf}(\%, 3) \\ &\quad y(x) = 3.67 (e^x)^2 - 2.43 (e^x)^3 + \frac{0.762}{(e^x)^4} \end{aligned} \quad (25)$$

$$\begin{aligned} &> \text{Ecua} \\ &\quad \frac{d^3}{dx^3} y(x) - \frac{d^2}{dx^2} y(x) - 14 \frac{d}{dx} y(x) + 24 y(x) = 0 \end{aligned} \quad (26)$$

$$\begin{aligned} &> \text{ComprobarUno} := \text{simplify}(\text{eval}(\text{subs}(x=0, \text{rhs}(\text{SolPart})))) \\ &\quad \text{ComprobarUno} := 2 \end{aligned} \quad (27)$$

$$\begin{aligned} &> \text{CondIni}[1] \\ &\quad y(0) = 2 \end{aligned} \quad (28)$$

$$\begin{aligned} &> \text{ComprobarDos} := \text{simplify}(\text{eval}(\text{subs}(x=0, \text{rhs}(\text{diff}(\text{SolPart}, x)))))) \\ &\quad \text{ComprobarDos} := -3 \end{aligned} \quad (29)$$

$$\begin{aligned} &> \text{CondIni}[2] \\ &\quad D(y)(0) = -3 \end{aligned} \quad (30)$$

$$\begin{aligned} &> \text{ComprobarTres} := \text{simplify}(\text{eval}(\text{subs}(x=0, \text{rhs}(\text{diff}(\text{SolPart}, x\$2)))))) \\ &\quad \text{ComprobarTres} := 5 \end{aligned} \quad (31)$$

$$\begin{aligned} &> \text{CondIni}[3] \\ &\quad D^{(2)}(y)(0) = 5 \end{aligned} \quad (32)$$

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