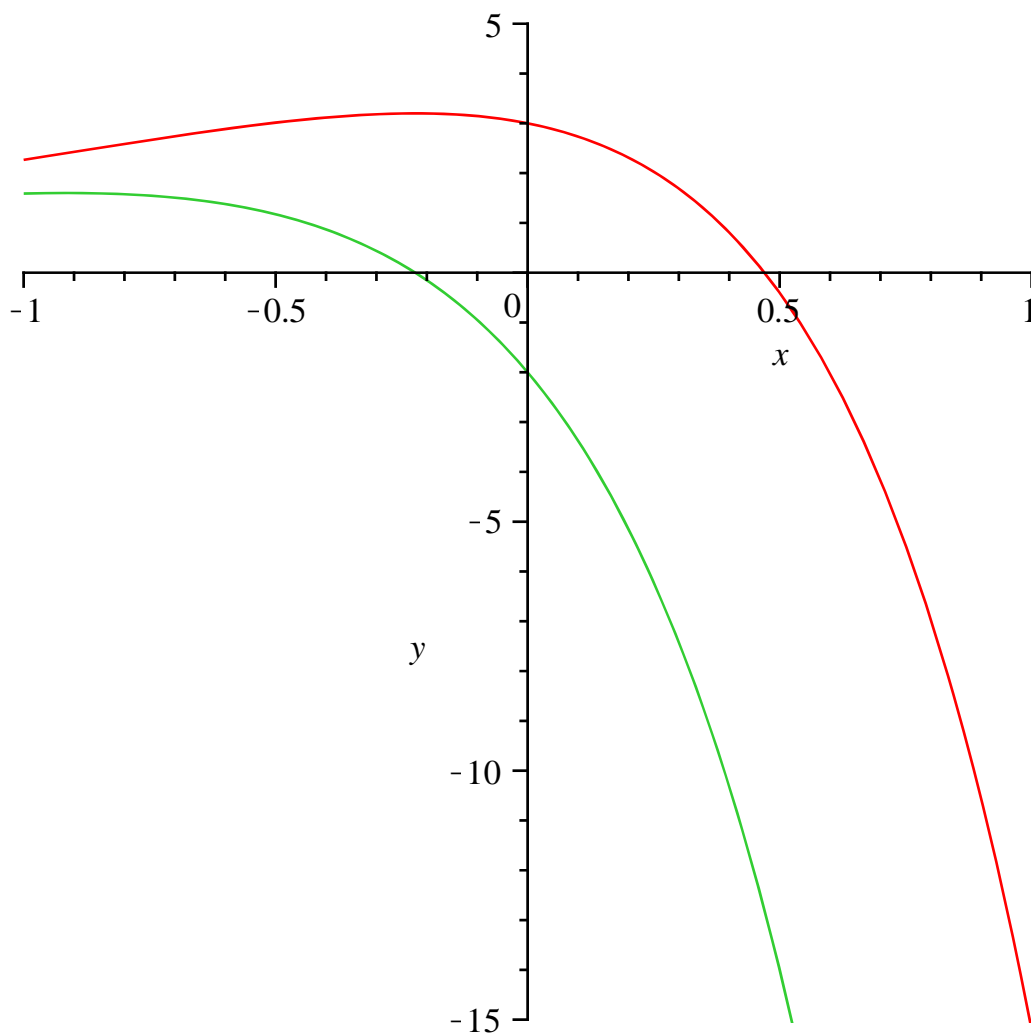


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[>
[DEFINICIONES BÁSICAS
[> restart
[> Ecuacion := diff(y(x), x) = y(x);
                                Ecuacion :=  $\frac{d}{dx} y(x) = y(x)$  (1)
[> SolucionGeneral := dsolve(Ecuacion);
                                SolucionGeneral :=  $y(x) = \_C1 e^x$  (2)
[> restart
[> SolucionGeneral := y(x) = C1·exp(x) + C2·exp(2·x)
                                SolucionGeneral :=  $y(x) = C1 e^x + C2 e^{2x}$  (3)
[> sistema := diff(SolucionGeneral, x), diff(SolucionGeneral, x, x) : sistema[1]; sistema[2];
                                 $\frac{d}{dx} y(x) = C1 e^x + 2 C2 e^{2x}$ 
                                 $\frac{d^2}{dx^2} y(x) = C1 e^x + 4 C2 e^{2x}$  (4)
[> SOLUCION := solve( {sistema}, {C1, C2} ) : SOLUCION[1]; SOLUCION[2];
                                
$$C1 = \frac{-\left(\frac{d^2}{dx^2} y(x)\right) + 2 \left(\frac{d}{dx} y(x)\right)}{e^x}$$

                                
$$C2 = -\frac{1}{2} \frac{-\left(\frac{d^2}{dx^2} y(x)\right) + \frac{d}{dx} y(x)}{e^{2x}}$$
 (5)
[> EcuacionDiferencialInicial := subs(C1 = rhs(SOLUCION[1]), C2 = rhs(SOLUCION[2]),
                                SolucionGeneral);
                                EcuacionDiferencialInicial :=  $y(x) = -\frac{1}{2} \frac{d^2}{dx^2} y(x) + \frac{3}{2} \frac{d}{dx} y(x)$  (6)
[> EcuacionDiferencialFinal := lhs(EcuacionDiferencialInicial)·2
                                - rhs(EcuacionDiferencialInicial)·2 = 0;
                                EcuacionDiferencialFinal :=  $2 y(x) + \frac{d^2}{dx^2} y(x) - 3 \left(\frac{d}{dx} y(x)\right) = 0$  (7)
[> SolucionGeneral;
                                 $y(x) = C1 e^x + C2 e^{2x}$  (8)
[> Solucion := dsolve(EcuacionDiferencialFinal);
                                Solucion :=  $y(x) = \_C1 e^x + \_C2 e^{2x}$  (9)
[> CondicionesIniciales := y(0) = 3, D(y)(0) = -2;
                                CondicionesIniciales :=  $y(0) = 3, D(y)(0) = -2$  (10)
[> SolucionParticular := dsolve( {EcuacionDiferencialFinal, CondicionesIniciales} );
                                SolucionParticular :=  $y(x) = 8 e^x - 5 e^{2x}$  (11)
[> plot( [rhs(SolucionParticular), rhs(diff(SolucionParticular, x)) ], x = -1 ..1, y = -15 ..5)

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> SolucionGeneral;
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$$y(x) = C1 e^x + C2 e^{2x} \quad (12)$$

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> Comprobacion := simplify(subs(y(x) = rhs(SolucionGeneral), EcuacionDiferencialFinal));
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$$\text{Comprobacion} := 0 = 0 \quad (13)$$

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> EcuacionDiferencialFinal;
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$$2 y(x) + \frac{d^2}{dx^2} y(x) - 3 \left(\frac{d}{dx} y(x) \right) = 0 \quad (14)$$

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