

[> restart :

[RESOLUCION DE SISTEMAS DE ECUACIONES DIFERENCIALES LINEALES

[> Sistema := diff(x(t), t) = 3·x(t) + 4·y(t), diff(y(t), t) = 2·x(t) + 5·y(t) : Sistema₁;
Sistema₂;

$$\frac{d}{dt} x(t) = 3 x(t) + 4 y(t)$$

$$\frac{d}{dt} y(t) = 2 x(t) + 5 y(t) \quad (1)$$

[> SolucionGeneral := dsolve({Sistema}) : SolucionGeneral₁; SolucionGeneral₂;

$$x(t) = _C1 e^{7t} + _C2 e^t$$

$$y(t) = _C1 e^{7t} - \frac{1}{2} _C2 e^t \quad (2)$$

[> comprobacion1 := simplify(eval(subs(x(t) = rhs(SolucionGeneral₁), y(t) = rhs(SolucionGeneral₂), lhs(Sistema₁) - rhs(Sistema₁) = 0)))

$$\text{comprobacion1} := 0 = 0 \quad (3)$$

[> comprobacion2 := simplify(eval(subs(x(t) = rhs(SolucionGeneral₁), y(t) = rhs(SolucionGeneral₂), lhs(Sistema₂) - rhs(Sistema₂) = 0)))

$$\text{comprobacion2} := 0 = 0 \quad (4)$$

[> Condiciones := x(0) = 4, y(0) = -6;

$$\text{Condiciones} := x(0) = 4, y(0) = -6 \quad (5)$$

[> SolucionParticular := dsolve({Sistema, Condiciones});

$$\text{SolucionParticular} := \left\{ x(t) = -\frac{8}{3} e^{7t} + \frac{20}{3} e^t, y(t) = -\frac{8}{3} e^{7t} - \frac{10}{3} e^t \right\} \quad (6)$$

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