

> restart

> Ecuacion := diff(y(t), t\$2) + gravedad = 0;

$$Ecuacion := \frac{d^2}{dt^2} y(t) + gravedad = 0 \quad (1)$$

> Solucion := dsolve(Ecuacion)

$$Solucion := y(t) = -\frac{1}{2} gravedad t^2 + C1 t + C2 \quad (2)$$

> ComprobacionUno := eval(subs(y(t) = rhs(Solucion), Ecuacion))

$$ComprobacionUno := 0 = 0 \quad (3)$$

> U(t) := diff(y(t), t\$2)

$$U(t) := \frac{d^2}{dt^2} y(t) \quad (4)$$

> SolucionIntermedia := int(U(t), t) = int(-gravedad, t) + C1

$$SolucionIntermedia := \frac{d}{dt} y(t) = -gravedad t + C1 \quad (5)$$

> V(t) := diff(y(t), t)

$$V(t) := \frac{d}{dt} y(t) \quad (6)$$

> SolucionFinal := int(V(t), t) = int(rhs(SolucionIntermedia), t) + C2

$$SolucionFinal := y(t) = -\frac{1}{2} gravedad t^2 + C1 t + C2 \quad (7)$$

> ComprobacionDos := eval(subs(y(t) = rhs(SolucionFinal), Ecuacion))

$$ComprobacionDos := 0 = 0 \quad (8)$$

> restart

> SolucionGeneral := y(x) = C1·exp(3 x) + C2·exp(-2 x)

$$SolucionGeneral := y(x) = C1 e^{3x} + C2 e^{-2x} \quad (9)$$

> Sistemita := diff(SolucionGeneral, x), diff(SolucionGeneral, x\$2) : Sistemita₁; Sistemita₂;

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

$$\frac{d^2}{dx^2} y(x) = 9 C1 e^{3x} + 4 C2 e^{-2x} \quad (10)$$

> SOLUCION := solve({Sistemita}, {C1, C2}) : SOLUCION₁; SOLUCION₂;

$$C1 = \frac{1}{15} \frac{\frac{d^2}{dx^2} y(x) + 2 \left(\frac{d}{dx} y(x) \right)}{e^{3x}}$$

$$C2 = -\frac{1}{10} \frac{-\left(\frac{d^2}{dx^2} y(x) \right) + 3 \left(\frac{d}{dx} y(x) \right)}{e^{-2x}} \quad (11)$$

> EcuacionInicial := subs(C1 = rhs(SOLUCION₁), C2 = rhs(SOLUCION₂),
SolucionGeneral);

$$EcuacionInicial := y(x) = \frac{1}{6} \frac{d^2}{dx^2} y(x) - \frac{1}{6} \frac{d}{dx} y(x) \quad (12)$$

> SolucionGeneral;

$$y(x) = C1 e^{3x} + C2 e^{-2x} \quad (13)$$

> EcuacionFinal := rhs(EcuacionInicial)·6 - lhs(EcuacionInicial)·6 = 0

$$EcuacionFinal := \frac{d^2}{dx^2} y(x) - \left(\frac{d}{dx} y(x) \right) - 6 y(x) = 0 \quad (14)$$

> Solucion := dsolve(EcuacionFinal);

$$Solucion := y(x) = _C1 e^{-2x} + _C2 e^{3x} \quad (15)$$

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