

$$\begin{aligned} &> \text{restart} \\ &> \text{EcuacionDiferencial} := \text{diff}(y(x), x) = 0 \\ &\quad \text{EcuacionDiferencial} := \frac{d}{dx} y(x) = 0 \end{aligned} \quad (1)$$

$$\begin{aligned} &> \text{Solucion} := \text{dsolve}(\text{EcuacionDiferencial}) \\ &\quad \text{Solucion} := y(x) = c_1 \end{aligned} \quad (2)$$

$$\begin{aligned} &> \text{Comprobacion} := \text{eval}(\text{subs}(y(x) = \text{rhs}(\text{Solucion}), \text{EcuacionDiferencial})) \\ &\quad \text{Comprobacion} := 0 = 0 \end{aligned} \quad (3)$$

$$\begin{aligned} &> \text{restart} \\ &> \text{Ecua} := y' = y \\ &\quad \text{Ecua} := \frac{d}{dx} y(x) = y(x) \end{aligned} \quad (4)$$

$$\begin{aligned} &> \text{SolGral} := \text{dsolve}(\text{Ecua}) \\ &\quad \text{SolGral} := y(x) = c_1 e^x \end{aligned} \quad (5)$$

$$\begin{aligned} &> \text{Comprobacion} := \text{eval}(\text{subs}(y(x) = \text{rhs}(\text{SolGral}), \text{lhs}(\text{Ecua}) - \text{rhs}(\text{Ecua}) = 0)) \\ &\quad \text{Comprobacion} := 0 = 0 \end{aligned} \quad (6)$$

#### PROBLEMA DEL ARCO Y LA FLECHA

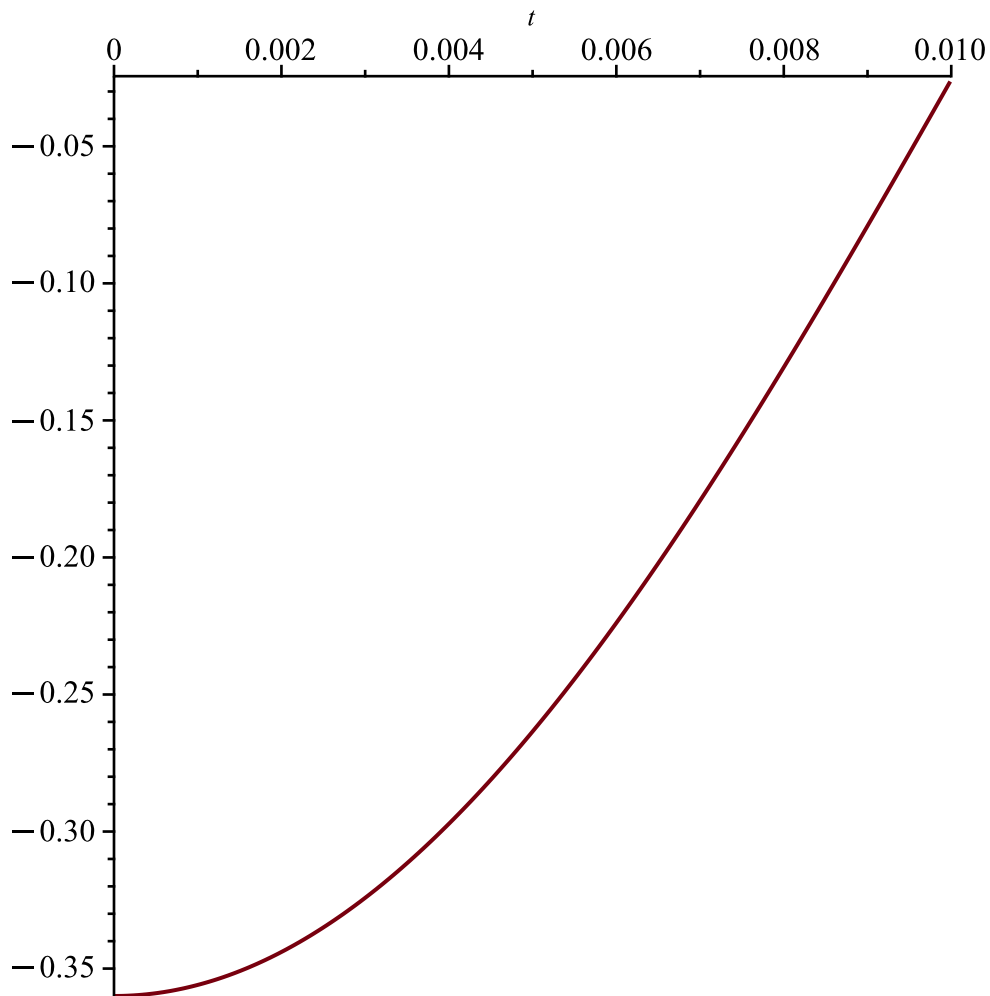
$$\begin{aligned} &> \text{restart} \\ &> \text{Hooke} := \left( \frac{(11)}{\left( \frac{30}{100} \right)} \right); \text{MasaFlecha} := \left( \frac{\left( \frac{16}{1000} \right)}{\left( \frac{981}{100} \right)} \right) \\ &\quad \text{Hooke} := \frac{110}{3} \\ &\quad \text{MasaFlecha} := \frac{8}{4905} \end{aligned} \quad (7)$$

$$\begin{aligned} &> \text{Ecua} := -\text{Hooke} \cdot s(t) = \text{MasaFlecha} \cdot \text{diff}(s(t), t\$2) \\ &\quad \text{Ecua} := -\frac{110 s(t)}{3} = \frac{8 \frac{d^2}{dt^2} s(t)}{4905} \end{aligned} \quad (8)$$

$$\begin{aligned} &> \text{CondIni} := s(0) = -\frac{36}{100}, D(s)(0) = 0 \\ &\quad \text{CondIni} := s(0) = -\frac{9}{25}, D(s)(0) = 0 \end{aligned} \quad (9)$$

$$\begin{aligned} &> \text{SolPart} := \text{dsolve}(\{\text{Ecua}, \text{CondIni}\}) : \text{evalf}(\%, 3) \\ &\quad s(t) = -0.360 \cos(150. t) \end{aligned} \quad (10)$$

$$> \text{plot}(\text{rhs}(\text{SolPart}), t = 0 .. 0.01)$$



$$\text{> } \textit{Tiempo} := \textit{solve}(\textit{rhs}(\textit{SolPart}) = 0) : \textit{evalf}(\%, 6) \quad 0.0104763 \quad (11)$$

$$\text{> } \textit{Velocidad} := \textit{subs}(t = \textit{Tiempo}, \textit{rhs}(\textit{diff}(\textit{SolPart}, t))) : \textit{evalf}(\%, 3); \frac{\textit{evalf}(\%, 3) \cdot 3600}{1000}$$

$$\textit{Velocidad} := \frac{9 \sqrt{3597} \sin\left(\frac{\pi}{2}\right)}{10}$$

$$54.0$$

$$194.4000000 \quad (12)$$

VUELO LIBRE FLECHA

$$\text{> } \textit{EcuaVertical} := \textit{diff}(y(t), t\$2) = -\frac{981}{100}$$

$$\textit{EcuaVertical} := \frac{d^2}{dt^2} y(t) = -\frac{981}{100} \quad (13)$$

$$\text{> } \textit{EcuaHorizontal} := \textit{diff}(x(t), t) = \textit{Velocidad} \cdot \cos\left(\frac{\text{Pi}}{4}\right)$$

$$\textit{EcuaHorizontal} := \frac{d}{dt} x(t) = \frac{9 \sqrt{3597} \sqrt{2}}{20} \quad (14)$$

$$\begin{aligned} &> \text{CondVertical} := y(0) = 2, D(y)(0) = \text{Velocidad} \cdot \sin\left(\frac{\text{Pi}}{4}\right) \\ &\quad \text{CondVertical} := y(0) = 2, D(y)(0) = \frac{9\sqrt{3597}\sqrt{2}}{20} \end{aligned} \quad (15)$$

$$\begin{aligned} &> \text{CondHoriz} := x(0) = 5 \\ &\quad \text{CondHoriz} := x(0) = 5 \end{aligned} \quad (16)$$

$$\begin{aligned} &> \text{SolVertical} := \text{dsolve}(\{\text{EcuaVertical}, \text{CondVertical}\}) : \text{evalf}(\%, 3) \\ &\quad y(t) = -4.90 t^2 + 38.2 t + 2. \end{aligned} \quad (17)$$

$$\begin{aligned} &> \text{SolHorizontal} := \text{dsolve}(\{\text{EcuaHorizontal}, \text{CondHoriz}\}) : \text{evalf}(\%, 3) \\ &\quad x(t) = 38.2 t + 5. \end{aligned} \quad (18)$$

>