

$$\begin{aligned} &> \text{restart} \\ &> \text{Ecuacion} := \text{diff}(y(t), t\$2) + \text{gravedad} = 0; \\ &\qquad\qquad\qquad \text{Ecuacion} := \frac{d^2}{dt^2} y(t) + \text{gravedad} = 0 \end{aligned} \tag{1}$$

$$\begin{aligned} &> \text{gravedad} := \frac{981}{100}; \\ &\qquad\qquad\qquad \text{gravedad} := \frac{981}{100} \end{aligned} \tag{2}$$

$$\begin{aligned} &> \text{Ecuacion}; \\ &\qquad\qquad\qquad \frac{d^2}{dt^2} y(t) + \frac{981}{100} = 0 \end{aligned} \tag{3}$$

$$\begin{aligned} &> \text{SolucionGeneral} := y(t) = -\frac{\text{gravedad}}{2} t \cdot 2 + C1 \cdot t + C2; \\ &\qquad\qquad\qquad \text{SolucionGeneral} := y(t) = -\frac{981}{200} t^2 + C1 t + C2 \end{aligned} \tag{4}$$

$$\begin{aligned} &> \text{CondicionesIniciales} := y(0) = 2, D(y)(0) = 67 \sin\left(\frac{\text{Pi}}{4}\right); \\ &\qquad\qquad\qquad \text{CondicionesIniciales} := y(0) = 2, D(y)(0) = \frac{67}{2} \sqrt{2} \end{aligned} \tag{5}$$

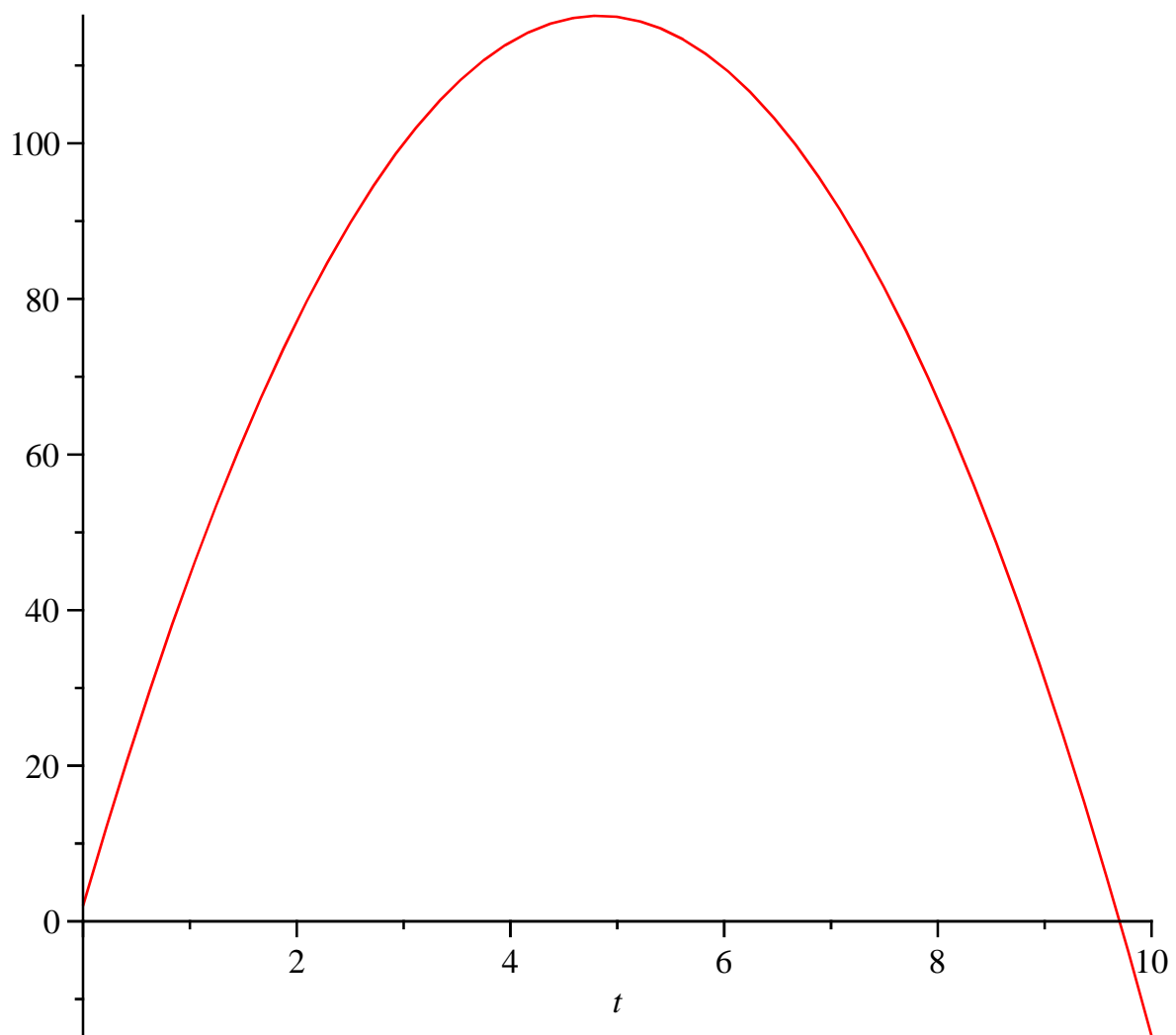
$$\begin{aligned} &> \text{Sistema} := \text{subs}(t=0, \text{rhs}(\text{SolucionGeneral}) = 2), \text{subs}\left(t=0, \text{rhs}(\text{diff}(\text{SolucionGeneral}, t))\right. \\ &\qquad\qquad\qquad \left.= 67 \sin\left(\frac{\text{Pi}}{4}\right)\right) : \text{Sistema}_1; \text{Sistema}_2; \\ &\qquad\qquad\qquad C2 = 2 \\ &\qquad\qquad\qquad C1 = \frac{67}{2} \sqrt{2} \end{aligned} \tag{6}$$

$$\begin{aligned} &> \text{Solucion} := \text{solve}(\{\text{Sistema}\}, \{C1, C2\}) : \text{Solucion}_1; \text{Solucion}_2; \\ &\qquad\qquad\qquad C1 = \frac{67}{2} \sqrt{2} \\ &\qquad\qquad\qquad C2 = 2 \end{aligned} \tag{7}$$

$$\begin{aligned} &> \text{SolucionParticular}_1 := y(t) = \text{subs}(C1 = \text{rhs}(\text{Solucion}_1), C2 = \text{rhs}(\text{Solucion}_2), \\ &\qquad\qquad\qquad \text{rhs}(\text{SolucionGeneral})) \\ &\qquad\qquad\qquad \text{SolucionParticular}_1 := y(t) = -\frac{981}{200} t^2 + \frac{67}{2} \sqrt{2} t + 2 \end{aligned} \tag{8}$$

$$\begin{aligned} &> \text{SolucionParticular}_2 := \text{dsolve}(\{\text{Ecuacion}, \text{CondicionesIniciales}\}); \\ &\qquad\qquad\qquad \text{SolucionParticular}_2 := y(t) = -\frac{981}{200} t^2 + \frac{67}{2} \sqrt{2} t + 2 \end{aligned} \tag{9}$$

$$> \text{plot}(\text{rhs}(\text{SolucionParticular}_1), t=0..10);$$



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> plot([subs(C1 = 1, C2 = 1, rhs(SolucionGeneral)), subs(C1 = 5, C2 = 10,
rhs(SolucionGeneral)), subs(C1 = 13, C2 = 17, rhs(SolucionGeneral)), subs(C1 = 16, C2
= 11, rhs(SolucionGeneral)), subs(C1 = 14, C2 = 18, rhs(SolucionGeneral)), subs(C1
= 12, C2 = 15, rhs(SolucionGeneral))], t = 0..4, color = [red, blue, green, yellow, black,
cyan, brown])
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