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$$ln[*]:= \omega_p = 1;$$
 $T_f = 20;$
 $y_x = 1;$
 $y_y = 0;$

$$sol = NDSolve \left[\left\{ y''[t] = -\frac{1}{2} \omega_p^2 * \frac{\left(1 + y[t]\right)^2 - 1}{\text{resolve numéricamente equação diferencla}}, y[0] = y_x, y'[0] = y_v \right\}, y[t], \{t, 0, T_f\} \right];$$

Plot[Evaluate[y[t] /. First@sol], $\{t, 0, T_f\}$]

$$\textit{Out[s]=} \; \left\{ \left\{ t \rightarrow \textbf{1.78675} \right\} \text{, } \left\{ t \rightarrow \textbf{4.09112} \right\} \text{, } \left\{ t \rightarrow \textbf{15.8469} \right\} \text{, } \left\{ t \rightarrow \textbf{7.66462} \right\} \text{, } \left\{ t \rightarrow \textbf{9.96899} \right\} \right\}$$

$$In[*]:= \omega_p = 1;$$
 $T_f = 20;$
 $y_x = 0.1;$
 $y_v = 0;$

$$sol = NDSolve \left[\left\{ y''[t] = -\frac{1}{2} \omega_p^2 * \frac{\left(1 + y[t]\right)^2 - 1}{\text{resolve numéricamente eq2ação diferenda}}, y[0] = y_x, y'[0] = y_v \right\}, y[t], \{t, 0, T_f\} \right];$$

Plot[Evaluate[y[t] /. First@sol], $\{t, 0, T_f\}$]

Out[*]=
-0.05
-0.10
-0.10
-0.10
-0.10
-0.10
-0.10

$$\label{eq:loss_sol} $$\inf_{\theta} = Table[FindRoot[Evaluate[y[t]] /.First@sol], \{t, 2*i\}], \{i, 1, 5\}]$$ $$ tabela [encontrar - calcula [primeiro] $$ Out[s] = \{\{t \to 1.60237\}, \{t \to 4.67574\}, \{t \to 1.60237\}, \{t \to 7.88049\}, \{t \to 10.9539\}\}$$ $$ In[s] = \omega_p = 1;$$$ T_f = 20;$$$ y_x = 2;$$$ y_v = 0;$$$$

$$sol = NDSolve \left[\left\{ y''[t] = -\frac{1}{2} \omega_p^2 * \frac{(1 + y[t])^2 - 1}{\text{resolve numéricamente eq2} ação diferenca}, y[0] = y_x, y'[0] = y_v \right\}, y[t], \{t, 0, T_f\} \right];$$

$Plot[Evaluate[y[t] /. First@sol], \{t, 0, T_f\}]$

