Ordinary differential equation with Laplace Transform

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A saber:

Ingrese la ecuación:

$$\frac{d^2}{dt^2}x(t) + 2\cdot\beta\cdot\frac{d}{dt}x(t) + \varpi_0^2\cdot x(t) = \frac{F_0}{m}\cdot\cos(\omega\cdot t)$$

Visualizar =

$$\frac{d^2}{dt^2}x(t) + 2\,\beta\left(\frac{d}{dt}x(t)\right) + \varpi_0^2\,x(t) = \frac{F_0\cos(\omega\,t)}{m}$$

β = 0 2 4 6 8 10 — 2 — m =

0 2 4 6 8 10 — 5 — F[0] = 10

ϖ[0] = 0 45 90 135 180 225 270 315 360 — 5 ° (1/36)*Pi rad — ω =

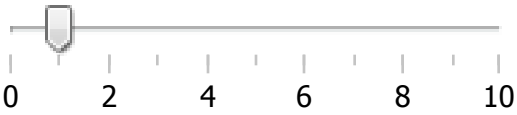
0 45 90 135 180 225 270 315 360 — 2 ° (1/90)*Pi rad

EDO usando los coeficientes =

$$\frac{d^2}{dt^2}x(t) + 4\left(\frac{d}{dt}x(t)\right) + 25\,x(t) - 2\cos(2\,t)$$

t[0]= 

0 s x(t[0]) =



1 x'(t[0]) =

2

P01 =

$$s^2\ laplace(x(t),\ t,\ s) - D(x)(0) - s\ x(0) + 4\ s\ laplace(x(t),\ t,\ s) - 4\ x(0) + 25\ laplace(x(t),\ t,\ s) - \frac{2\ s}{s^2 + 4}$$

P02 =

$$laplace(x(t),\ t,\ s) = \frac{D(x)(0) + s\ x(0) + 4\ x(0) + \frac{2\ s}{s^2 + 4}}{s^2 + 4\ s + 25}$$

P03 =

$$laplace(x(t),\ t,\ s) = \frac{6 + s + \frac{2\ s}{s^2 + 4}}{s^2 + 4\ s + 25}$$

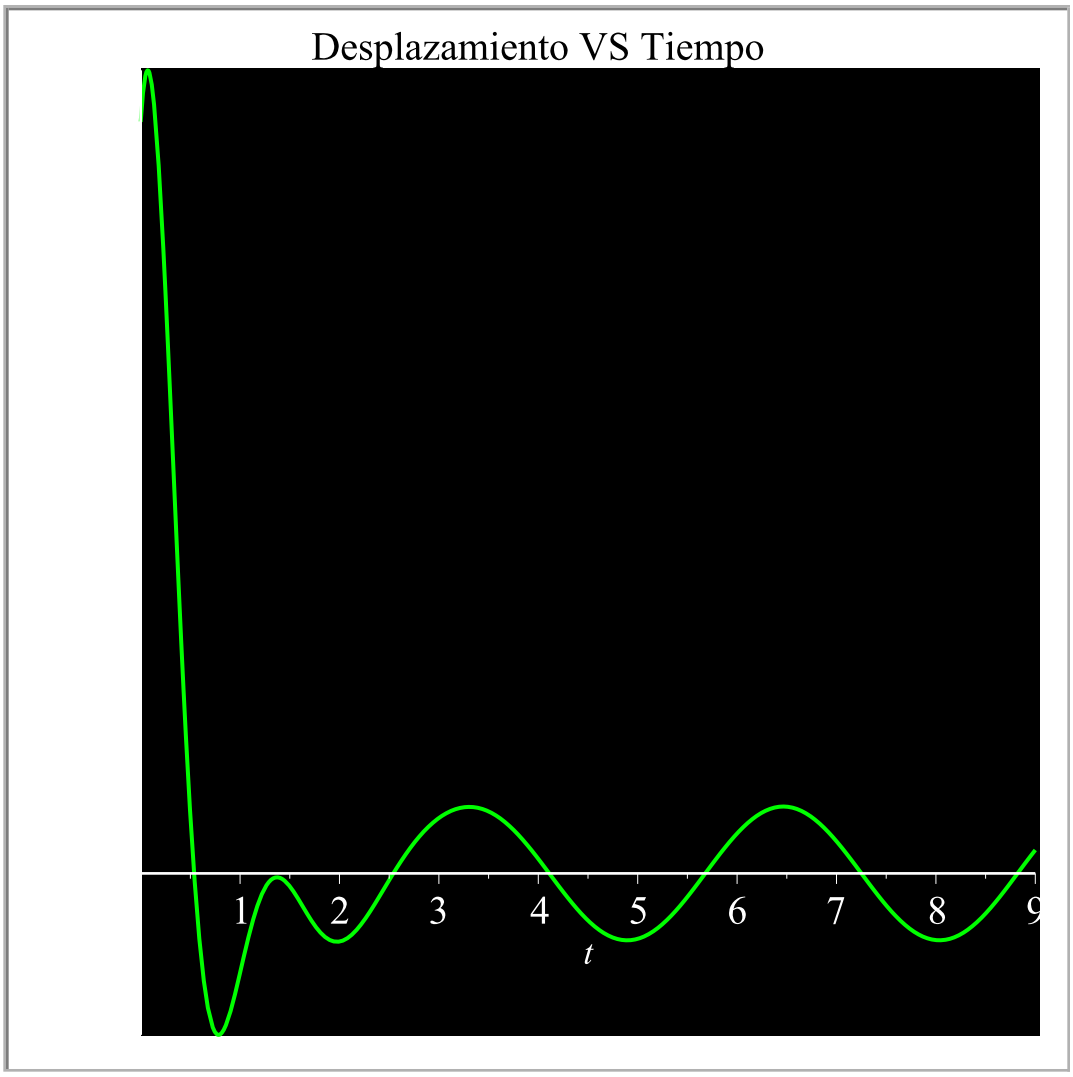
P04 =

$$laplace(x(t),\ t,\ s) = \frac{1}{505}\ \frac{42\ s + 32}{s^2 + 4} + \frac{1}{505}\ \frac{463\ s + 2830}{s^2 + 4\ s + 25}$$

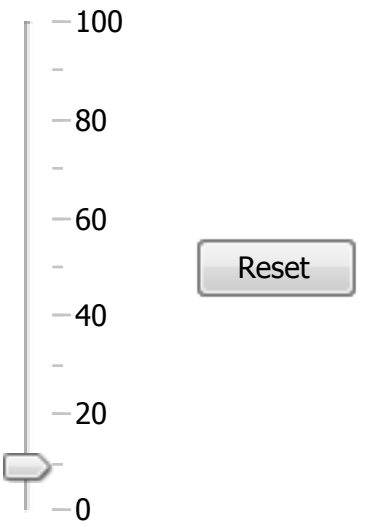
P05 =

$$x(t) = \frac{272}{1515}\, e^{-2t} \sin\left(\sqrt{21}\, t\right)\sqrt{21} + \frac{463}{505}\, e^{-2t} \cos\left(\sqrt{21}\, t\right) + \frac{42}{505} \cos(2t) + \frac{16}{505} \sin(2t)$$

Gráfica



t =



Ingrese la solución para animar:

$$\frac{272}{1515}\, e^{-2\ \ t\cdot A} \sin\left(\sqrt{21}\ t\cdot A\right)\sqrt{21} + \frac{463}{505}\, e^{-2\ \ t\cdot A} \cos\left(\sqrt{21}\ t\cdot A\right) + \frac{42}{505}\cos(2\ t\cdot A) + \frac{16}{505}\sin(2\ t\cdot A)$$

Simulación

$A = 0.$