

Kreuzfahrts-Berichte

17.08.2008

Mechanik

Übung

$$E \frac{d^2 y}{dx^2} = P y - \frac{1}{2} k x^2$$

mit den Werten

$$E = 2.5 \frac{d^2 y}{dx^2} = 5 y - \frac{1}{2} 0.5 x^2$$

$$1.25 \frac{d^2 y}{dx^2} = 5 y - 0.25 x^2$$

$$\frac{d^2 y}{dx^2} - 5 y = -0.25 x^2$$

Übung 4

1) Command window

close all

clear

clc

ODE = sym('n(t)', t)

$$\text{ODE} = \text{diff}(n(t), 2) - \text{diff}(n(t)) = 14t^4 t^3 + 12 - 5$$

$$Dn = \text{diff}(n, t)$$

cond =

$$y_{\text{sol}} = \text{dsol}(\text{ODE})$$

$$\text{cond1} = (n == 5) \text{ cond2}$$

$$\text{cond2} = (Dn == -0.5)$$

$$\text{cond} = (\text{cond1}; \text{cond2})$$

$$y_{\text{sol}} = \text{dsol}(\text{ODE}, \text{cond})$$

$$t = 0 : 0.1 : 1.5$$

$$\text{plot}(y_{\text{sol}}, t)$$

$$t_n = \text{subs}(y_{\text{sol}}, t)$$

$$\text{plot}(t_n, t)$$

4b) . Command window

close all

clear

clc

format y n t

Ode1 = diff(y, t) - 2 * x = exp(-2t);

Ode2 = diff(y, t) + y = exp(-t);

ODES = (Ode1 ; Ode2);

ySol = dsolve(ODES);

Cond1 = ~~diff~~(x == 0)

Cond2 = (y == 0);

Cond = (Cond1 ; Cond2)

ySol = dsolve(ODES, Cond)

i) $(x_{sol}t, y_{sol}t) = dsolve(ODES, Cond)$.

ii) $x_{sol}(t) = dsolve(x_{sol}t)$

$y_{sol}(t) = y_{sol}t$.

subplot(x_sol_t)

hold on

subplot(y_sol_t)

axis on

grid on