

## Facitliste 23. kursusgang

> restart;

Opgave 503

> eq503:=diff(x(t),t,t)-3\*diff(x(t),t)+2\*x(t)=0;

$$eq503:=\frac{d^2}{dt^2}x(t)-3\left(\frac{d}{dt}x(t)\right)+2x(t)=0 \quad (1)$$

> dsolve(eq503);

$$x(t) = _C1e^t + _C2e^{2t} \quad (2)$$

Opgave 504

> eq504:=diff(x(t),t,t)-6\*diff(x(t),t)-16\*x(t)=0;

$$eq504:=\frac{d^2}{dt^2}x(t)-6\left(\frac{d}{dt}x(t)\right)-16x(t)=0 \quad (3)$$

> dsolve(eq504);

$$x(t) = _C1e^{8t} + _C2e^{-2t} \quad (4)$$

Opgave 505

> eq505:=diff(x(t),t,t)+2\*diff(x(t),t)+5\*x(t)=0;

$$eq505:=\frac{d^2}{dt^2}x(t)+2\left(\frac{d}{dt}x(t)\right)+5x(t)=0 \quad (5)$$

> dsolve(eq505);

$$x(t) = _C1e^{-t}\sin(2t) + _C2e^{-t}\cos(2t) \quad (6)$$

Opgave 506

> eq506:=diff(x(t),t,t)-2\*diff(x(t),t)+17\*x(t)=0;

$$eq506:=\frac{d^2}{dt^2}x(t)-2\left(\frac{d}{dt}x(t)\right)+17x(t)=0 \quad (7)$$

> dsolve(eq506);

$$x(t) = _C1e^t\sin(4t) + _C2e^t\cos(4t) \quad (8)$$

Opgave 507

> eq507:=diff(x(t),t,t)-3\*diff(x(t),t)+2\*x(t)=0;

$$eq507:=\frac{d^2}{dt^2}x(t)-3\left(\frac{d}{dt}x(t)\right)+2x(t)=0 \quad (9)$$

> dsolve(eq507);

$$x(t) = _C1e^{2t} + _C2e^t \quad (10)$$

Forskellen mellem Opgave 503 og Opgave 507 er, at i dette sidste tilfælde skal man lade konstanterne variere over alle **komplekse** tal.

Opgave 508

> eq508:=diff(x(t),t,t)-6\*diff(x(t),t)+9\*x(t)=0;

$$eq508 := \frac{d^2}{dt^2} x(t) - 6 \left( \frac{d}{dt} x(t) \right) + 9 x(t) = 0 \quad (11)$$

> **dsolve(eq508);**

$$x(t) = \_C1 e^{3t} + \_C2 e^{3t} t \quad (12)$$

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