# 10.2.4.

$$\mathbf{X}' = \begin{pmatrix} 1 & 4 \\ 1 & 1 \end{pmatrix} \mathbf{X}$$

$$\mathbf{X}(t) = e^{t} c_1 \begin{pmatrix} 2\cos 2t \\ \sin 2t \end{pmatrix} + c_2 \begin{pmatrix} 2\sin 2t \\ \cos 2t \end{pmatrix} +$$

$$\text{Villkor} : \mathbf{X}(0) = \begin{pmatrix} 1 \\ 1 \end{pmatrix}.$$

$$\begin{pmatrix} 1 \\ 1 \end{pmatrix} = \begin{pmatrix} 2 & 0 \\ 0 & 1 \end{pmatrix} \mathbf{C}, \quad \mathbf{C} = \begin{pmatrix} 1/2 \\ 1 \end{pmatrix}$$

$$\mathbf{X}(t) = e^{t} \begin{pmatrix} \cos 2t & 2\sin 2t \\ \dfrac{\sin 2t}{2} & + \cos 2t \end{pmatrix}$$

Komplexa egenvärden: $=-1\pm 2i$.

**Stabil spiral.**

```
plot([(cos(2*t)-2*sin(2*t))*exp(-t),

(1*sin(2*t)/2+cos(2*t))*exp(-t), t=0..10]);
```