Beispiel 5.11

Buch:Höhere Mathematik sehen und verstehen, Haftendorn, Riebesehl, Dammer, Springer Spektrum, Feb. 2021

Datei InhomogenesSystem.nb zu Abschnitt 4.6.5 Seite 339, Abb. 4.24

Homogenes System

```
sol = {x[t], y[t]} /. DSolve[{x'[t] == y[t], y'[t] == 0}, {x[t], y[t]}, t][[1]]
```

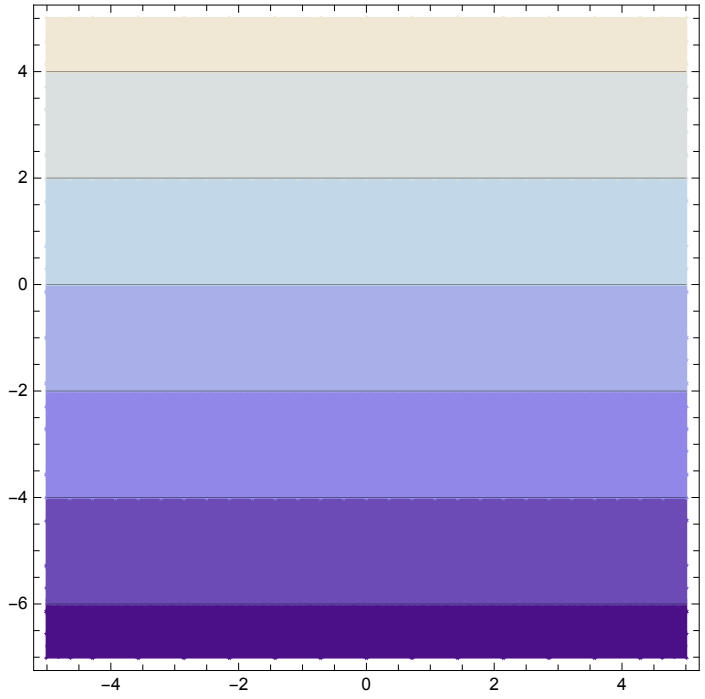
```
{C[1] + t C[2], C[2]}
```

```
gl = Eliminate[{x, y} == sol, t]
```

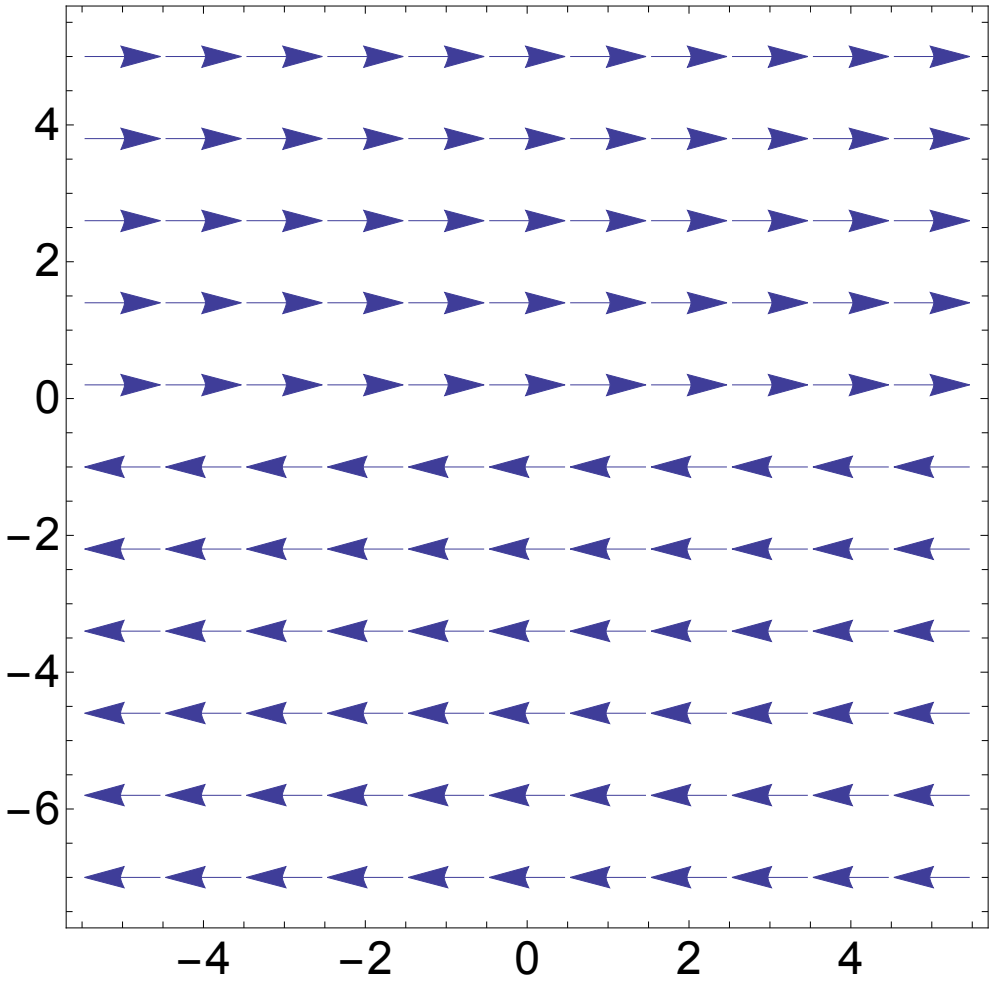
```
C[2] == y
```

```
werte = {a → 2, b → 1};
```

```
ContourPlot[y /. werte, {x, -5, 5}, {y, -7, 5}]
```



```
VectorPlot[{y, 0} /. werte, {x, -5, 5}, {y, -7, 5}, VectorPoints → 11,
 VectorScale → {0.06, Automatic, None}, BaseStyle → FontSize → 24]
```



Inhomogenes System

```
sol = {x[t], y[t]} /. DSolve[{x'[t] == y[t] + a, y'[t] == b}, {x[t], y[t]}, t][[1]]
```

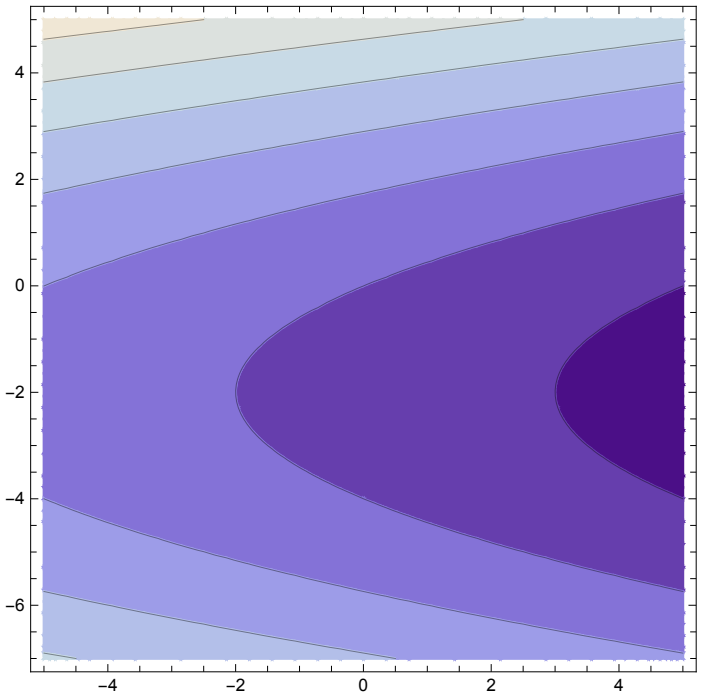
$$\left\{a\,t+\frac{b\,t^2}{2}+C[1]+t\,C[2],\ b\,t+C[2]\right\}$$

```
gl = Eliminate[{x, y} == sol, t]
```

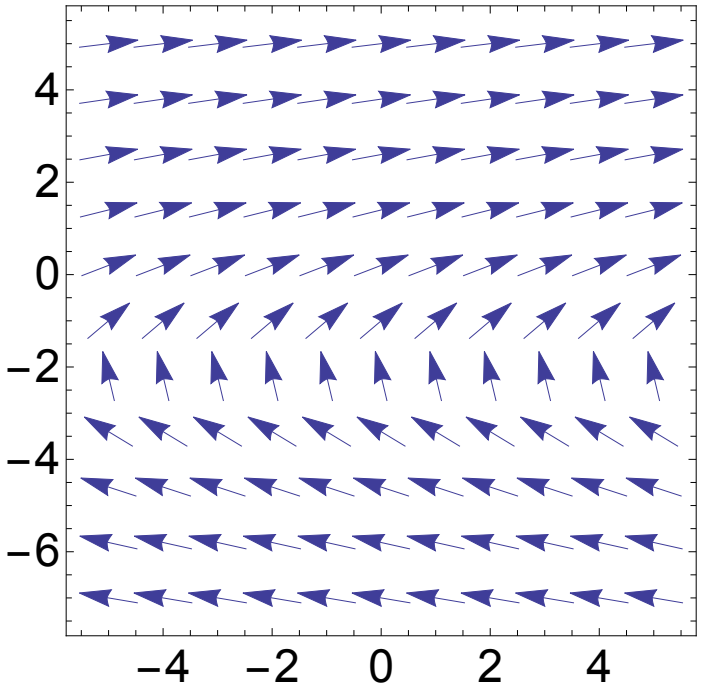
$$2\,b\,x-2\,b\,C[1]+2\,a\,C[2]+C[2]^2==2\,a\,y+y^2$$

```
werte = {a → 2, b → 1};
```

```
ContourPlot[2 a y + y^2 - 2 b x /. werte, {x, -5, 5}, {y, -7, 5}]
```




```
VectorPlot[{y + a, b} /. werte, {x, -5, 5}, {y, -7, 5}, VectorPoints → 11,
 VectorScale → {0.07, Automatic, None}, BaseStyle → FontSize → 24]
```



```
StreamPlot[{y + a, b} /. werte, {x, -5, 5}, {y, -7, 5},
 BaseStyle → FontSize → 24, StreamScale → {Large, 6, Automatic}]
```