

```

In[14]:= ClearAll["Global`*"]
Clear[minx, miny, maxx, maxy]
minx = -2;
miny = -2;
maxx = 2;
maxy = 2;

In[62]:= Clear[sol, x, y, t]
sol[x0_, y0_] := NDSolve[
  {x'[t] == (θ + 1) * x[t] + 3 * y[t],
   y'[t] == -2 * x[t] + (θ - 1) * y[t],
   x[0] == x0, y[0] == y0},
  {x, y}, {t, -100, 10}]

In[22]:= initialCond = Join[
  Table[{x, maxy}, {x, minx, maxx, 0.1}],
  Table[{minx, y}, {y, miny, maxy, 0.1}],
  Table[{x, miny}, {x, minx, maxx, 0.1}],
  Table[{maxx, y}, {y, miny, maxy, 0.1}]
];

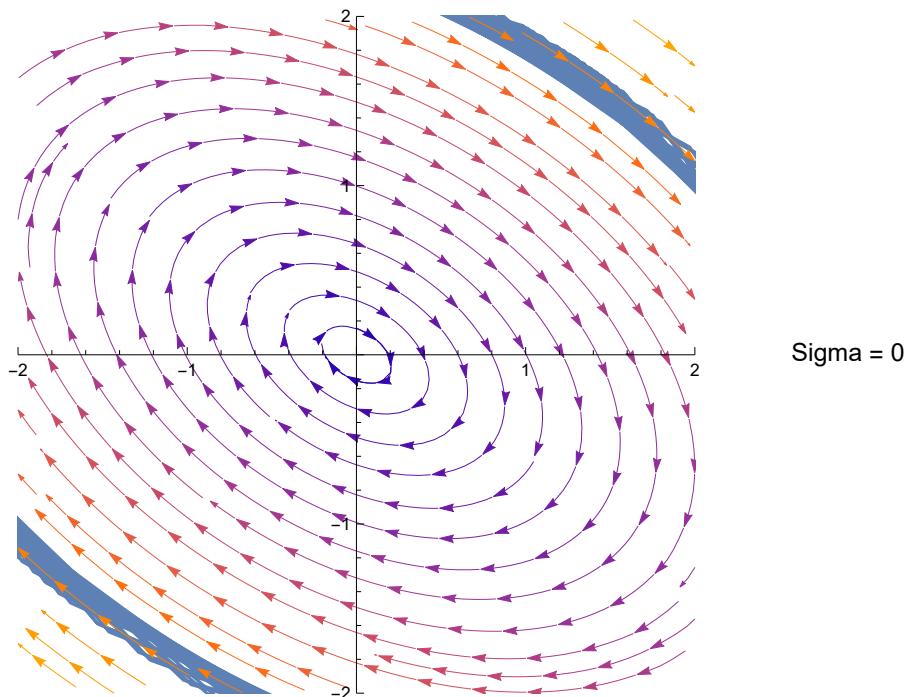
```

```
In[64]:= Show[ParametricPlot[
  Evaluate[{x[t], y[t]} /. sol[initialCond[[50, 1]], initialCond[[50, 2]]]],
  {t, -1000, 10}, PlotRange -> {{minx, maxx}, {miny, maxy}}],
 StreamPlot[{(0 + 1)*x + 3*y, -2*x + (0 - 1)*y}, {x, -2, 2}, {y, -2, 2}],
 ListPlot[{{0, 0}}, PlotStyle -> {PointSize[0.03], Red},
 PlotMarkers -> {"", Large}, PlotLegends -> {"Sigma = 0"}]
]
```

••• **InterpolatingFunction**: Input value {-999.979} lies outside the range of data in the interpolating function. Extrapolation will be used.

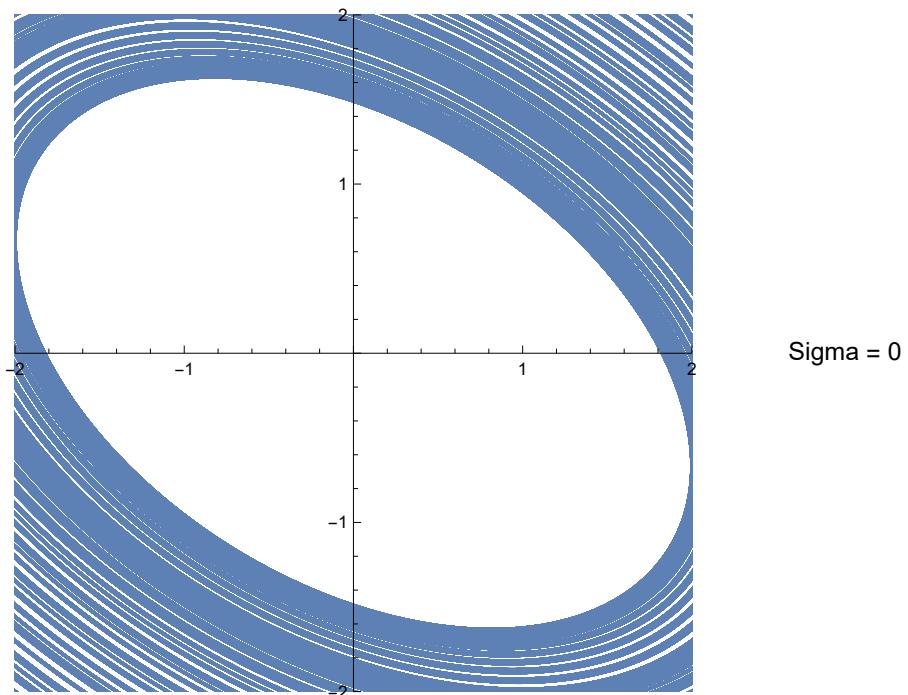
••• **InterpolatingFunction**: Input value {-999.979} lies outside the range of data in the interpolating function. Extrapolation will be used.

Out[64]=



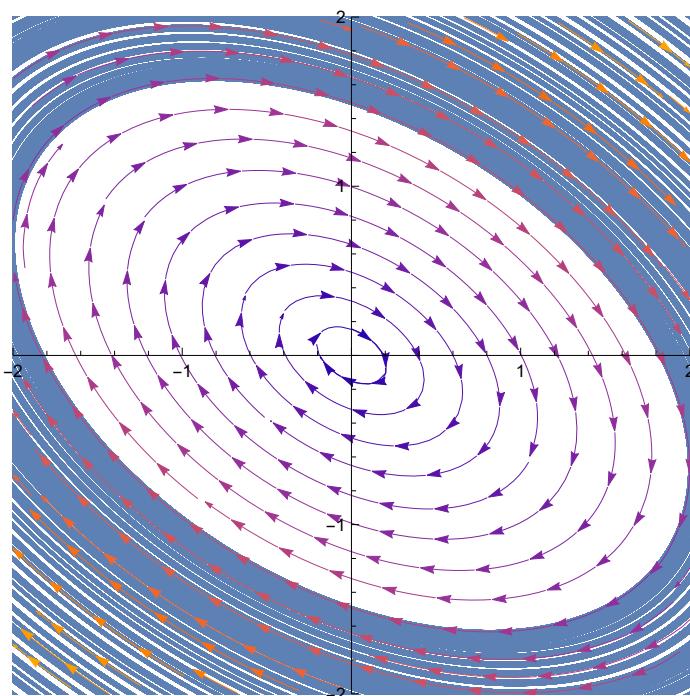
```
In[65]:= p2 = Show[
  Table[
    ParametricPlot[
      Evaluate[{x[t], y[t]} /. sol[initialCond[[i, 1]], initialCond[[i, 2]]]],
      {t, -100, 10}, PlotRange -> {{minx, maxx}, {miny, maxy}}],
    {i, 1, Length[initialCond]}],
  ListPlot[{{0, 0}}, PlotStyle -> {PointSize[0.03], Red},
  PlotMarkers -> {"", Large}, PlotLegends -> {"Sigma = 0"}]
]
```

Out[65]=



```
In[66]:= Show[p2, StreamPlot[{(θ + 1) * x + 3 * y, -2 * x + (θ - 1) * y}, {x, -2, 2}, {y, -2, 2}],  
PlotRange → {{minx, maxx}, {miny, maxy}}]
```

Out[66]=



Sigma = 0