In[956]:=
```
ClearAll["Global`"]
μ = 1/10;
ω = 1;
ν = 1;
r0 = Sqrt[μ];
T = 2*Pi/(μ*ν+ω);
rDot[r_] = μ*r - r^3;
thetaDot[r_] = ω  +ν*r^2;

JacobianPolar[r_, theta_] =
  {{D[rDot[r], r], D[rDot[r], theta]}, {D[thetaDot[r], r], D[thetaDot[r], theta]}};

JacobianLimitCycle = JacobianPolar[r0, theta];
M[t] = {{M11[t], M12[t]}, {M21[t], M22[t]}};

eqs = {D[M[t], t] == JacobianLimitCycle.M[t],
   (M[t] /. t → 0) == IdentityMatrix[2]};

sol = FullSimplify[DSolve[eqs, {M11[t], M12[t], M21[t], M22[t]}, t]];
MPolar = M[t] /. sol[[1]] /. t → T;

r[x_, y_] = Sqrt[x^2 + y^2];
theta[x_, y_] = ArcTan[y/x];
JacobianTransformation =
  {{D[r[x, y], x], D[r[x, y], y]}, {D[theta[x, y], x], D[theta[x, y], y]}};
MCartesian = Inverse[JacobianTransformation].MPolar.JacobianTransformation;
MCartesianLimitCycle = MCartesian /. {x → r0, y → 0}

eigenval = Eigenvalues[MCartesianLimitCycle];
sigma1 = 1/T*Log[eigenval[[1]]];
sigma2 = 1/T*Log[eigenval[[2]]];
{sigma2, sigma1}
```

Out[974]= $\left\{\left\{e^{-4\pi/11}, 0\right\}, \left\{1 - e^{-4\pi/11}, 1\right\}\right\}$

Out[978]= $\left\{-\frac{1}{5}, 0\right\}$

Out[346]= $\left\{\left\{e^{-t/5}, 0\right\}, \left\{\sqrt{10}\left(1 - e^{-t/5}\right), 1\right\}\right\}$