



TWs!

in the nonlinear case

A, B, C and D are the four matrix-elements of the Jacobian matrix, evaluated at the critical point (= stationary point)

$$\frac{dx}{dt} = Ax + By$$

$$\frac{dy}{dt} = Cx + Dy$$

$$p = A + D = \text{trace} \begin{bmatrix} A & B \\ C & D \end{bmatrix}$$

$$q = AD - BC = \det \begin{bmatrix} A & B \\ C & D \end{bmatrix}$$

$$\Delta = p^2 - 4q$$

("discriminant")