Übungsserie 3

Lösung

Aufgabe 1:

x0 = [[1.1] [0.9]]
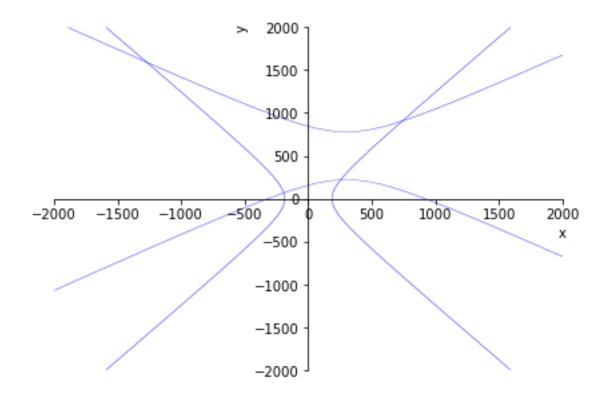
- 1. Iteration
  f = [[-1.42] [-1.044]]
  Df = [[-18. -3.6] [-3.6 5.32]]
  ||f|| = 1.7624800708093145
  delta = [[-0.10405445] [0.12582781]]
  ||x{n+1} - xn|| = 0.16327880407243942
  x1 = [[0.99594555] [1.02582781]]

- 2. Iteration
  f = [[-0.03166528] [0.23133302]]
  Df = [[-18. -4.10331126] [-4.10331126 8.64409027]]
  ||f|| = 0.23349016523989502
  delta = [[0.00391759] [-0.02490232]]
  ||x{n+1} - xn|| = 0.02520859288823088
  x2 = [[0.99986314] [1.00092549]]

Aufgabe 2:

- Starwert: p1 = [-200, 50], Lösung: q1 = [-193.29480327, 66.5648162]

- Startwert: p2 = [250, 200], Lösung q2 = [254.22156715, 219.30670531]

- Startwert: p3 = [750, 900], Lösung q3 = [740.32882609, 906.82594105]

- Startwert: p4 = [-1250, 1600], Lösung q4 = [-1273.34283621, 1594.1145313]

Aufgabe 3:

- Lösung: x_3 = [1.0000001, 4., 2.]