

Math 3280 Worksheet 41: Hopf bifurcations

Group members (2 to 4): _____

(1) Convert the system

$$x' = ax + y - x(x^2 + y^2)$$

$$y' = -x + ay - y(x^2 + y^2)$$

to system for r' and θ' in polar coordinates r, θ .

(2) Solve the polar differential equations and sketch the solutions for $a = -1$ and $a = 1$.