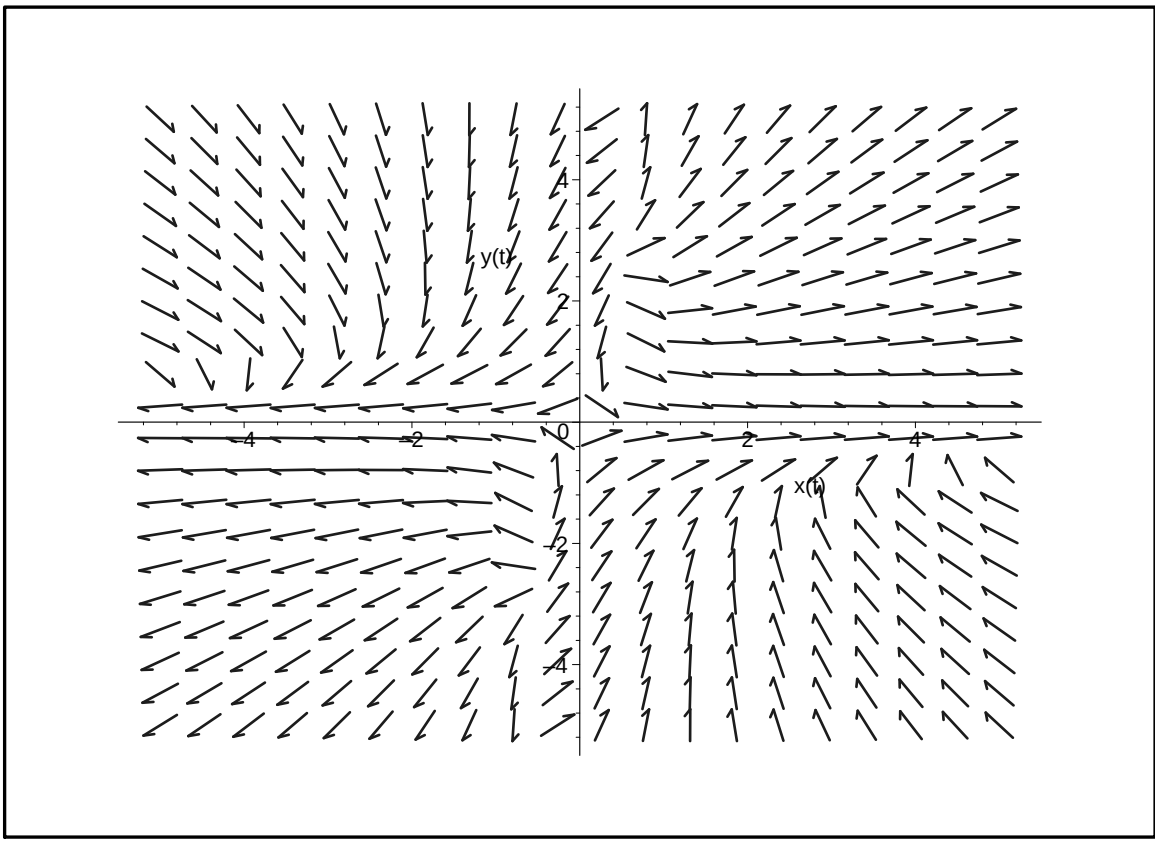
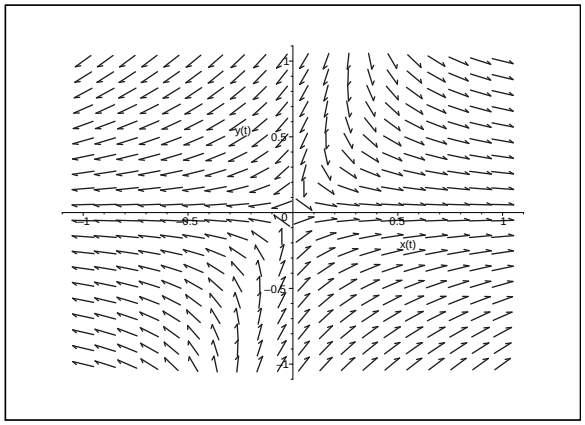
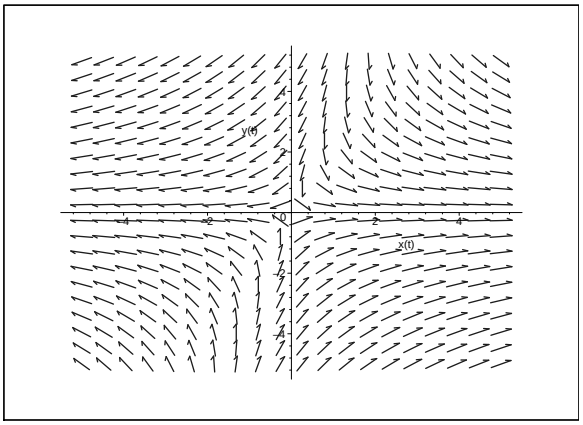
Math 286
Differential Equations

Section 5.1 Handout
Kate Bella

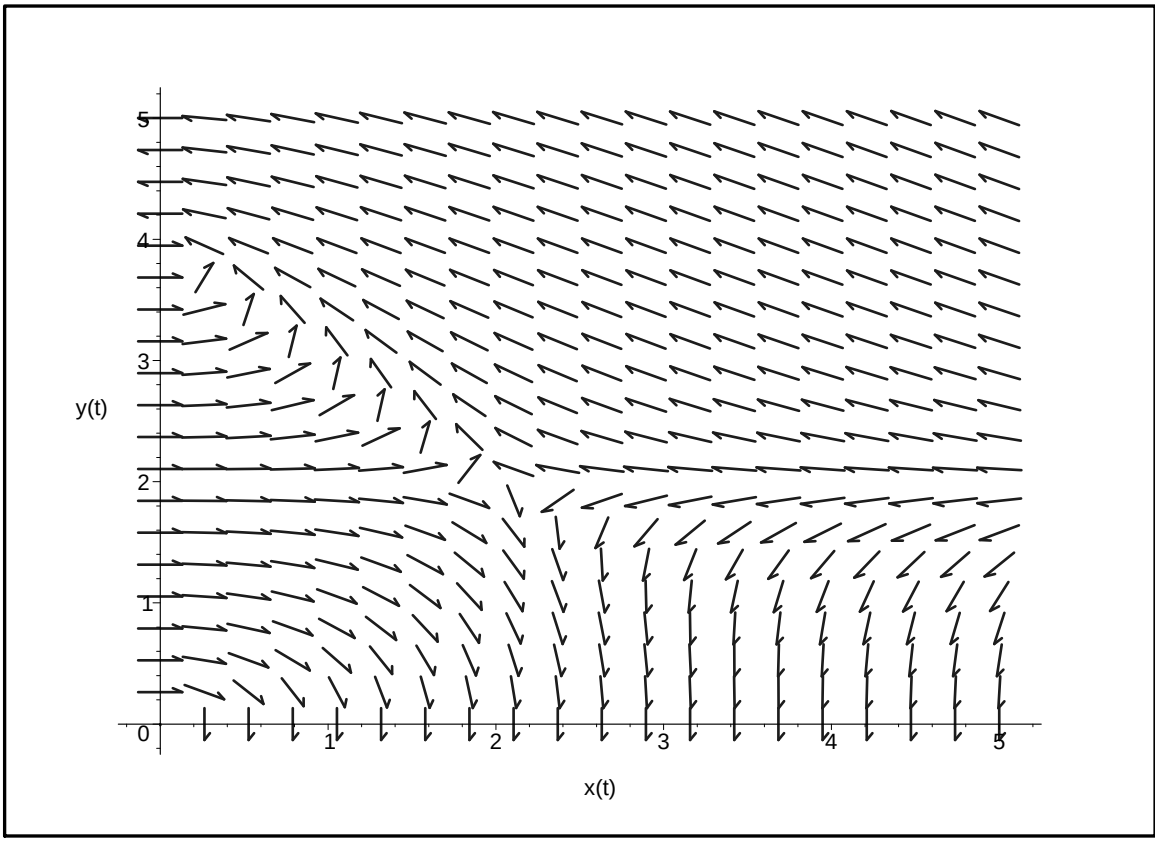


Phase portrait for the nonlinear system $\begin{cases} \dfrac{dx}{dt} = 3x - y + x^2 y \\ \dfrac{dy}{dt} = -2y + xy^2 \end{cases}$.

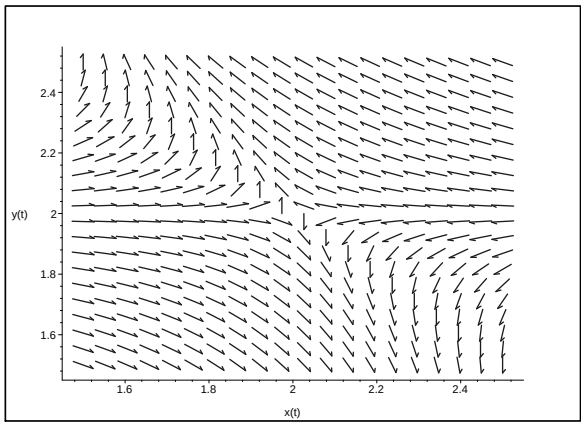


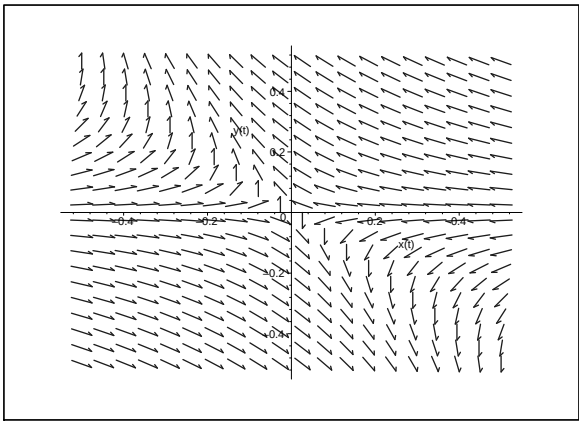


Phase portrait for nonlinear system near the origin, and phase portrait for the linearized system near the origin.

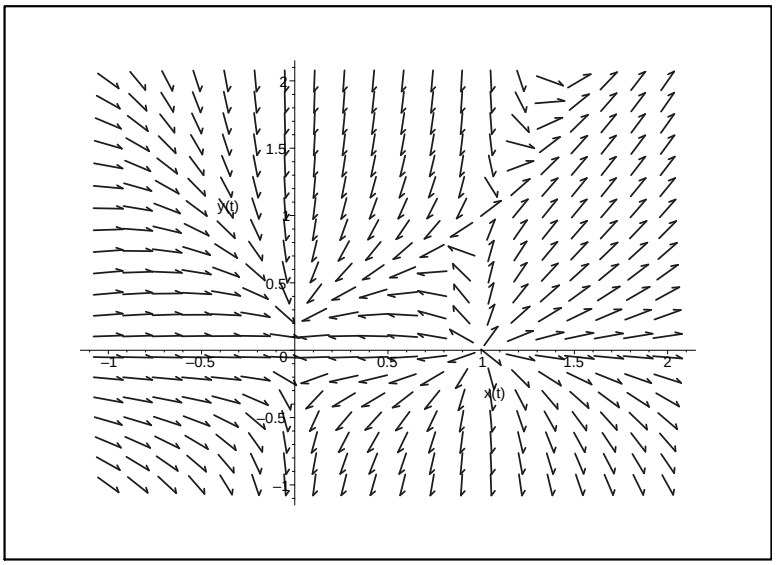


Phase portrait for the nonlinear system $\begin{cases} \dfrac{dx}{dt} = y(4-x-y) \\ \dfrac{dy}{dt} = x(y-2) \end{cases}$.

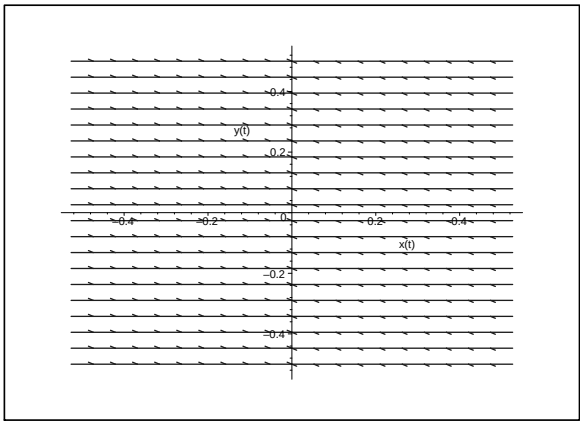


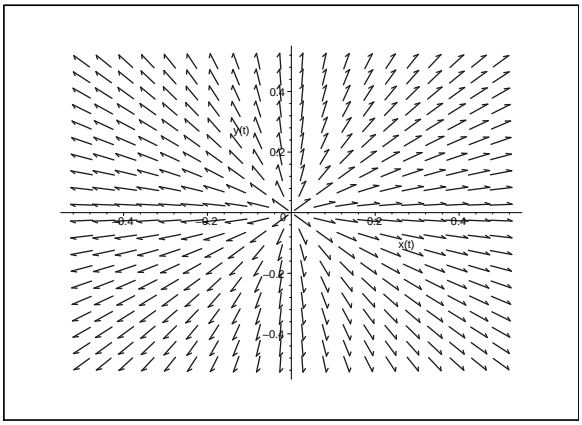


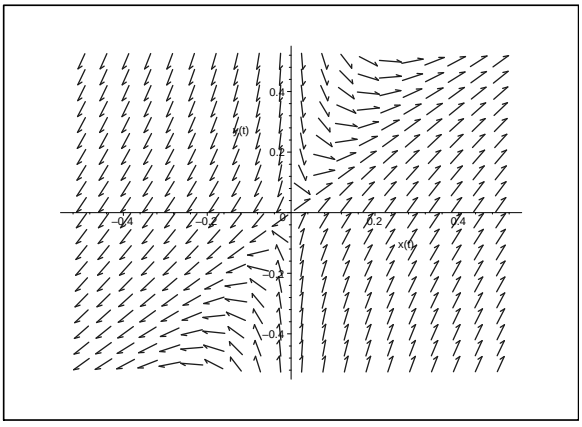
Phase portrait for nonlinear system near the equilibrium point at $(2, 2)$, and phase portrait for the linearized system near the origin.



Phase portrait for the nonlinear system $\begin{cases} \dfrac{dx}{dt} = x(x-1) \\ \dfrac{dy}{dt} = y(x^2-y) \end{cases}$.







Phase portraits of the linearizations at the origin, the equilibrium point $(1, 0)$, and at the equilibrium point at $(1, 1)$.