

Problem Set 12.2

Find the equilibrium points for the nonlinear systems and assess the stability of each equilibrium points.

1. $x' = x(x + y + 4)$, $y' = y(x - 2y + 1)$

2. $x' = x(y - 2)$, $y' = y(x - 3)$

3. $x' = x^2 + y^2 - 25$, $y' = x + y - 7$

4. $x' = x - e^y$, $y' = x + e^{2y} - 2$

5. $x' = -x + y^2$, $y' = x + y^4 - 2$