

For each of the following DEs,

(a) List all the equilibria.

(b) Find the eigenvalue at each equilibrium.

(c) Draw the phase line portrait (PLP). Make sure to show the equilibria and stability arrows.

1. $\frac{dN}{dt} = 2N\left(1 - \frac{N}{90}\right)$

2. $\frac{dx}{dt} = x(x - 1)(x + 2)$

3. $\frac{dx}{dt} = x^3(x + 2)$

4. $\frac{dy}{dx} = (y - 2)^2(y - 3)$

5. $\frac{dN}{dt} = 5N$