

1. Find the fixed points of the following 1-d flows:

$$\dot{x} = x(1 - x), \quad \dot{x} = -3x, \quad \dot{x} = x^2(1 - x)$$

Determine the stability properties of these fixed points by

- (a) graphical method
- (b) linearisation

2. Find the fixed points of the following 1-d maps:

$$x' = rx\left(1 - \frac{x}{K}\right), \quad x' = 2x$$

$$x' = \frac{1}{2}x^2(1 - x), \quad x' = 5x^2(1 - x)$$

Determine the stability properties of these fixed points by

- (a) graphical method
- (b) linearisation

3. Find the fixed points of the following 2-d flow:

$$\dot{x} = -x + 3y, \quad \dot{y} = 3x + y + 1$$

Determine the stability properties of these fixed points by linearisation.

4. Find the fixed points of the following 2-d map:

$$x' = 3x(1 - x - y), \quad y' = 4y\left(1 - y - \frac{3}{2}x\right)$$

Determine the stability properties of these fixed points by linearisation.