Nonlinear Predator-Prey Model

Activity Sheet

1. Consider the nonlinear predator-prey system with two populations: foxes and rabbits. Suppose the initial population of foxes and rabbits is (45,350). Assuming the birth and death factors for foxes are 0.0002 and 0.88 and birth and death factors for rabbits are 1.032 and 0.0007, calculate the population of foxes and rabbits at time $t = 25$.

2. Consider the nonlinear predator-prey system with two populations: foxes and rabbits. Suppose the initial population of foxes and rabbits is (45,300). Assuming the birth and death factors for foxes are 0.0003 and 0.77 and birth and death factors for rabbits are 1.02 and 0.0006, calculate the population of foxes and rabbits at time $t = 100$.

3. Consider the nonlinear predator-prey system with two populations: foxes and rabbits. Suppose the initial population of foxes and rabbits is (32,300). Assuming the birth and death factors for foxes are 0.001 and 0.88 and birth and death factors for rabbits are 1.032 and 0.002, calculate the population of foxes and rabbits at time $t = 25$.

4. Consider the nonlinear predator-prey system with two populations: foxes and rabbits. Suppose the initial population of foxes and rabbits is (40,40). Assuming the birth and death factors for foxes are 0.001 and 0.88 and birth and death factors for rabbits are 1.032 and 0.002, calculate the population of foxes and rabbits at time $t = 35$.

5. Consider the nonlinear predator-prey system with two populations: foxes and rabbits. Suppose the initial population of foxes and rabbits is (20,100). Assuming the birth and death factors for foxes are 0.001 and 0.88 and birth and death factors for rabbits are 1.032 and 0.002, calculate the population of foxes and rabbits at time $t = 125$.

6. Consider the nonlinear predator-prey system with two populations: foxes and rabbits. Suppose the initial population of foxes and rabbits is (22,300). Assuming the birth and death factors for foxes are 0.001 and 0.6 and birth and death factors for rabbits are 1.02 and 0.002, calculate the population of foxes and rabbits at time $t = 25$.