

Name _____

1. Consider the dynamical system

$$u(n) = 0.3u(n-1) - 0.5v(n-1) + 30$$

$$v(n) = 0.2u(n-1) + v(n-1) - 4$$

- (a) Find the equilibrium point.

- (b) Does the equilibrium point appear to be stable or unstable? Show enough work to justify your answer.

2. Suppose the population of a town is currently 800, and it is growing by 20 people per year. Let $u(n)$ represent the population of this town n years from now.

(a) Find a discrete dynamical system along with an initial value for $u(n)$.

(b) Find an explicit formula for $u(n)$.

3. Suppose the population of a town is currently 600, and it is growing by 5% per year. Let $u(n)$ represent the population of this town n years from now.

(a) Find a discrete dynamical system along with an initial value for $u(n)$.

(b) Find an explicit formula for $u(n)$.