

Name \_\_\_\_\_

1. Suppose that a population of deer grows logistically with an intrinsic growth rate of 20% and a carrying capacity of 500.

(a) Determine a discrete dynamical system with initial value to model this deer population.

(b) Determine the maximum interval of stability for this deer population.

2. Suppose we have the following discrete dynamical system.

$$u(n) = 0.1u^2(n-1) + 0.3u(n-1) + 1$$

(a) Find each equilibrium value for this discrete dynamical system and state whether it appears to be stable or unstable.

(b) For each stable equilibrium value, determine the maximum interval of stability.

(c) For each stable equilibrium value, suppose that  $u(0)$  is within the maximum interval of stability. Approximate the rate at which  $u(n)$  goes toward the equilibrium value.