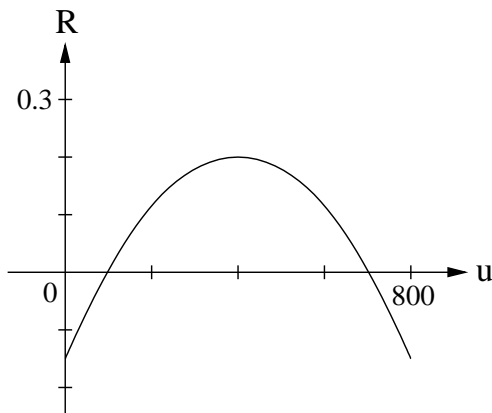


Name \_\_\_\_\_

1. A population can be modeled by the following discrete dynamical system

$$u(n) = u(n-1) + R \cdot u(n-1)$$

where  $R$  is a function of the population  $u$  and is shown in the following graph.



- (a) (1 point) Determine the intrinsic growth rate for this population?
- (b) (2 points) Find all 3 equilibrium values for this population.
- (c) (3 points) Sketch a rough graph of the population as a function of time, being sure to show each equilibrium value clearly and being sure to show what happens to any initial populations which are above or below each positive equilibrium value.

(d) (1 point) Determine the minimum viable population.

(e) (2 points) Find a formula for  $R$  as a function of  $u$  given that its graph is a parabola.

(f) (1 point) If  $u(0) = 200$ , then what is the value of  $u(10)$  ?