

Quiz 9

Key

1. Consider a bacteria population where the population doubles every hour.

- (a) Write down a discrete dynamical system that models the bacteria population. Use the variable b_t for the bacteria population at time t .

$$b_{t+1} = 2b_t$$

- (b) What is the experiment in this discrete dynamical system?

Wait one hour.

- (c) What is the updating function?

$$f(x) = 2x.$$

- (d) Find the first four steps of the solution to the discrete dynamical system with the initial condition $b_0 = 30$.

$$b_1 = 60, b_2 = 120, b_3 = 240, b_4 = 480.$$

- (e) Write down the solution to this discrete dynamical system with the initial value $b_0 = 30$.

$$b_t = 30 \cdot 2^t.$$