

## Homework assigned Wednesday, January 18.

**Problem 1.** A group of 42 penguins is released on a large island. Penguins breed just once a year, so we expect the growth of the size of the population of penguins to be discrete exponential. The size of the population of penguins after 5 years is 98.

- (a) Find a formula for  $N_t$ , the size of the population of penguins, after  $t$  years. *Answer:*  $N_t = 42(1.18466)^t$
- (b) What is the yearly percent of increase of the population? *Answer:* 18.466%
- (c) How long until there are 1,000 penguins? *Answer:*  $t = 18.7074$  years.

**Problem 2.** If is population of fish that breed once a year increases by 5% per year and has an initial population of 900, then how long until there are one hundred thousand fish? *Answer:*  $t = 96.55$  years.