Population & Community Ecology Homework 1

Problem 1

In this problem we look to find the density of duckweed plants per m^2 after 47 days. We will estimate the future population using the exponential growth formula, $N_t = N_0 e^{rt}$ where the initial population, N_0, is 11.1 duckweed plants per m^2. We can calculate the rate of unitless population change, r, by dividing the estimate after 20 day from the initial population.

```
r = 23.5/11.1
r
```

```
## [1] 2.117117
```

Thus with r= 2.12, we can calculate N_{27} as $N_{27} = 11.1e^{2.12 \times 47}$.

```
## [1] 2.081734e+44
```

Thus after a total of 47 days, the population density will be 2.08×10^{44} duckweed plants per m^2.

Problem 2

Problem 3

Problem 4

Problem 5

Survivorship, as defined by $\frac{S_x}{S_0}$, is calculated in the vector below.

```
age <- 0:4
sx <- c(740,280,105,32,0)
bx <- c(0,0.4,1.3,3,8,NA)
lx <- sx/740
print(lx)
```

```
## [1] 1.00000000 0.37837838 0.14189189 0.04324324 0.00000000
```

I assume that g(x) was meant to be p(x)

Solving for p(x)

Problem 6