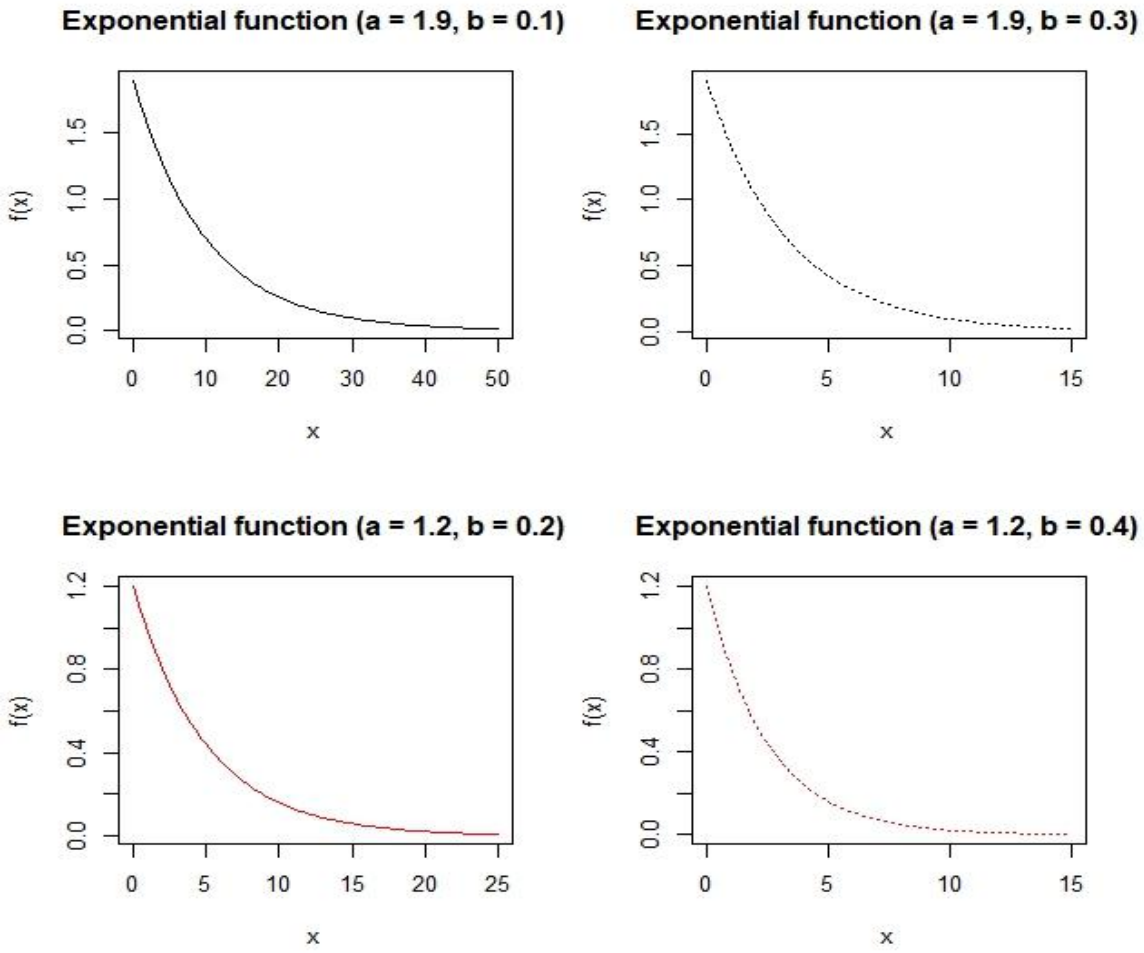
Evan Krause
ECO634
Prof. Michael F. Nelson
10/12/22

1.

```
exp_fun <- function(a, b, x) {
  return(a * exp(-b * x))
}
```

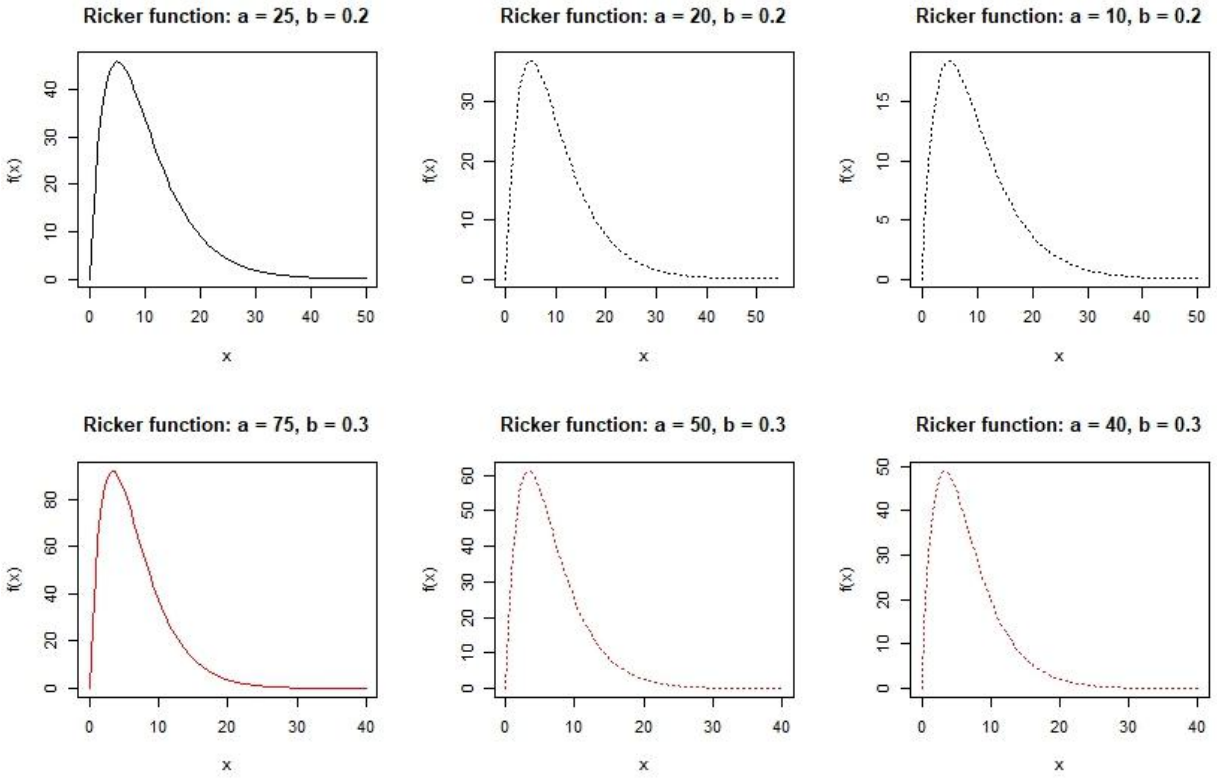
2.



3. As you vary parameter **a** in exp_fun, the starting height of the curve on the Y-axis is changed

4. As you vary parameter **b** in exp_fun, the rate of change in the curve is increased or decreased

5.

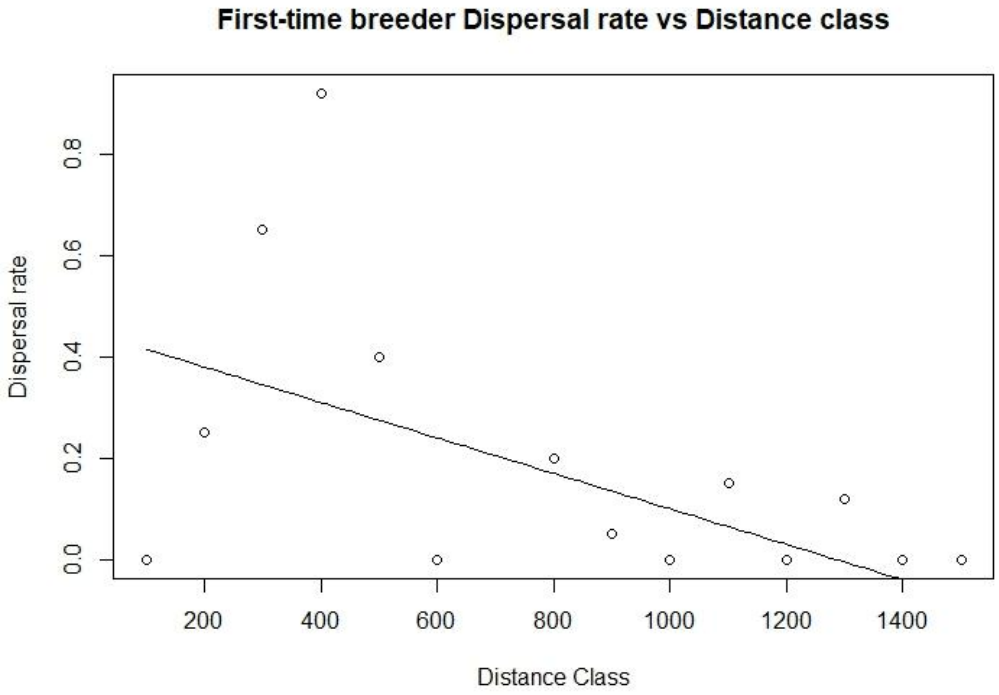


6. As you vary parameter **a** in ricker_fun, the max height of the initial curve on the y-axis is changed

7. As you vary parameter **b** in ricker_fun, the rate of change in the curve is increased or decreased

8. Slope = -0.00035, x1 = 0, y1 = 0.45. I chose the y1 value by guessing where the majority of the plotted values were below. I chose the slope by taking y1 and dividing it by an estimate of the largest x-value. X1 is zero because that just looked right.

9.

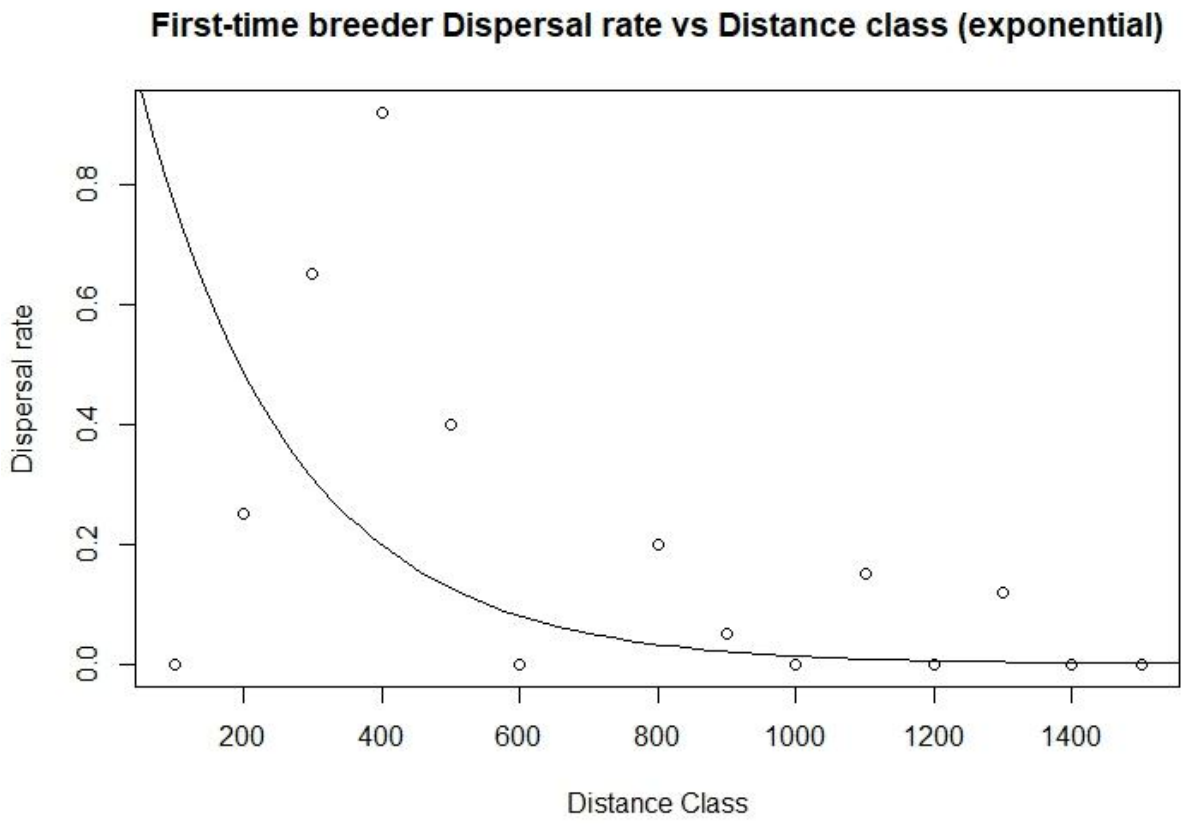


10.

a = 1.2, b = 0.0045

I chose these values because the value of **a** is inclusive of all the shown points and the line created from using **b** most closely resembles the rate of change in the given points

11.

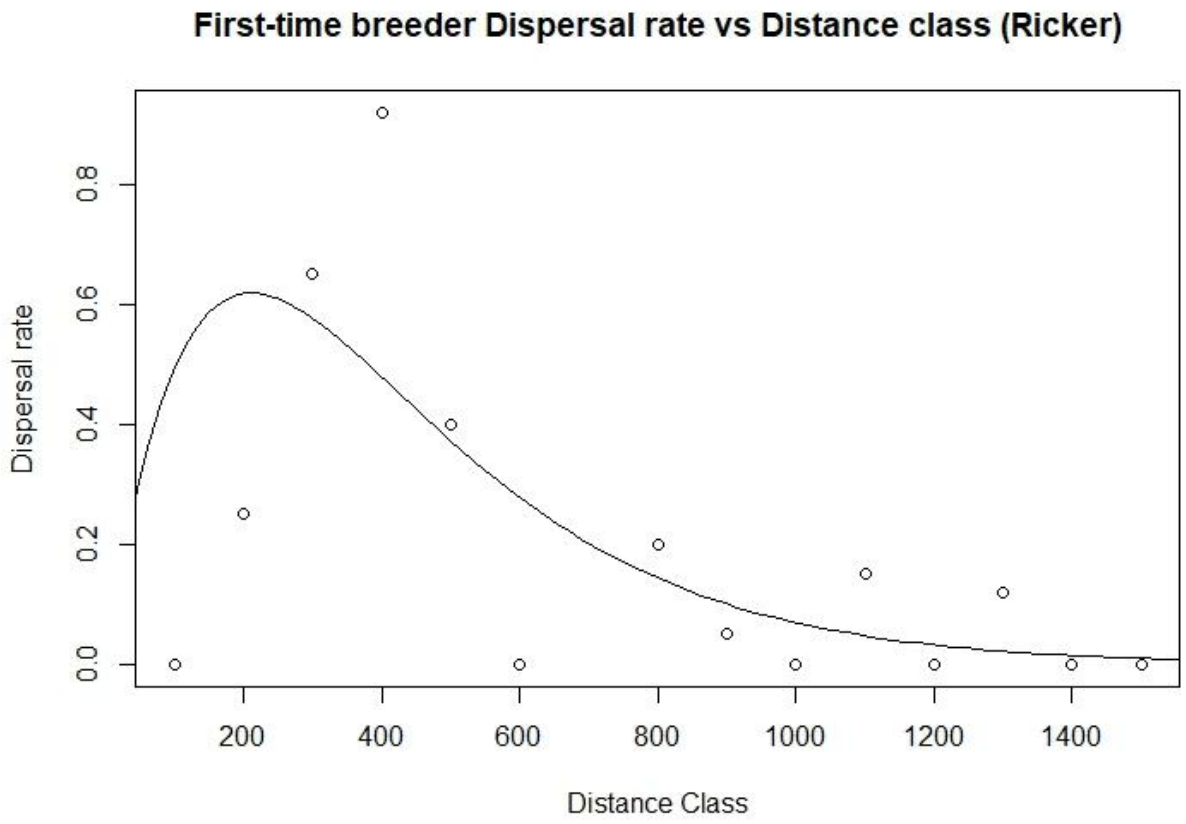


12.

a = 0.008, b = 0.00475

I chose these values because the initial slope given by **a** is sufficient to include the majority of the given points and the rate of change given by **b**

13.



14.

```
resids_linear <- data.frame(lm_obs - lm_exp)
resids_exp <-  data.frame(expo_obs - expo_exp)
resids_ricker <-  data.frame(rick_obs - rick_exp)

residual_model_df <- cbind(resids_linear, resids_exp, resids_ricker)
```

15.