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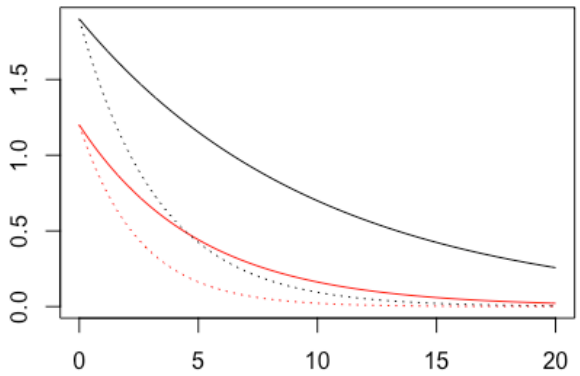
Prof. Nelson
Lab 5
10/17/2021

1.

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

curve(
  exp_fun(x, 0.3, (1/15)), add = FALSE, from = 0, to = 50,
  ann = FALSE, axes = TRUE, ylab = "f(x)"); box()
```

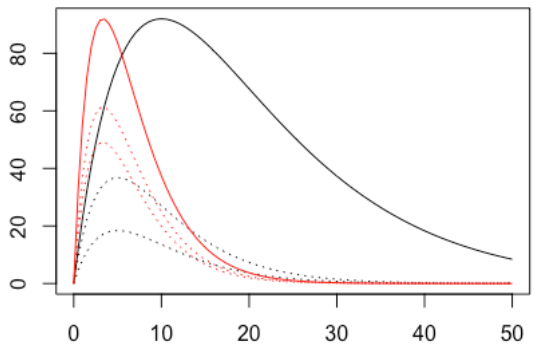
2.



3.
When the parameter “a” changes, the starting point of the exponential curve changes.

4.
When the parameter “b” changes the depth/exaggeration of the curve changes. As “b” increases the depth of the curve deepens.

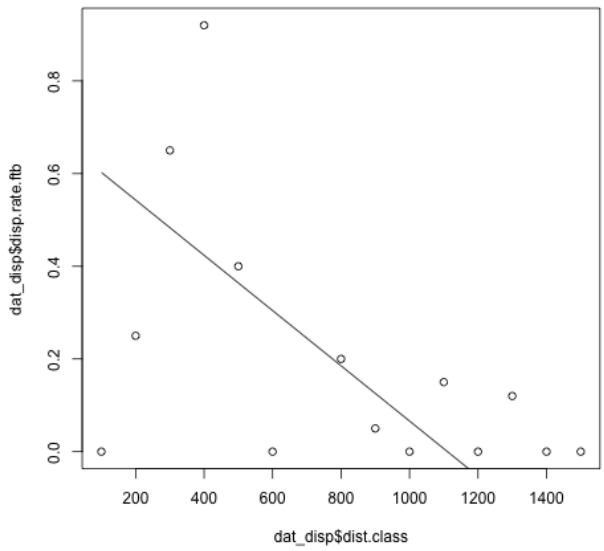
5.



6.
The parameter “a” decides the initial slope of the line, and thus, when “a” changes the slope changes.

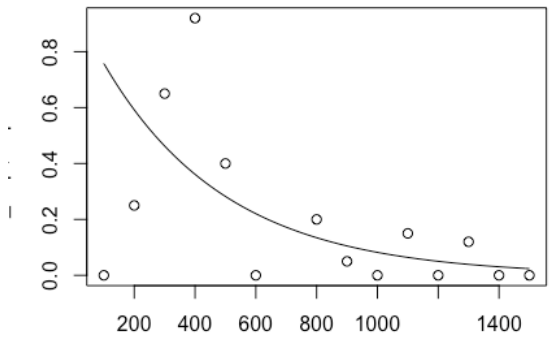
7.
When the parameter “b” changes the peak of the line changes.

8.
I used locator(1) to choose my x (797) and y (0.187) coordinate, then for slope (-0.000596) I used locator(1) twice to pick two points I want the line to go through and used a rise over run formula.



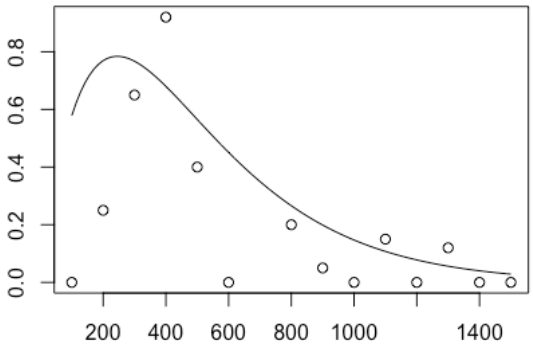
9.
10.
Parameter “a” is 0.97 and “b” is (1/405), after working and hypothesizing, these parameters allow the curve to fit the data as close as possible.

11.



12.
Parameter “a” is 0.0087 and “b” is (1/245), also through hypothesizing because I know what the parameters can change.

13.



14.
locator(15)

dat_disp$resids_ricker <- c(00.59611652, 0.69225830, 0.77321980, 0.75297943, 0.69225830,
0.61129680, 0.48479446, 0.39371277, 0.30263109, 0.19636912,
0.13058790, 0.09010715, 0.05468649, 0.03950621, 0.02432593)

dat_disp$resids_linear <- c(0.672, 0.646, 0.606, 0.550, 0.489, 0.454, 0.393, 0.332,
0.241, 0.196, 0.150, 0.0850,
0.0496, 0.00408, 0.00331)

dat_disp$resids_exp <- c(0.78333999, 0.71249868, 0.63659727, 0.55563577, 0.43419352,
0.31781137, 0.22672968, 0.16600856, 0.13564799, 0.10022734,
0.06986678, 0.05468649, 0.03950621, 0.03444612, 0.021432)

```
resid_linear <- c(dat_disp$disp.rate.ftb - dat_disp$resids_linear)
resid_exp <- c(dat_disp$disp.rate.ftb - dat_disp$resids_exp)
resid_ricker <- c(dat_disp$disp.rate.ftb - dat_disp$resids_ricker)
par(mfrow = c(3, 1))
hist(resid_linear, main = "Histogram of Linear Resids", xlab = "", col = "light green", xlim =
c(-0.5, 0.5))
hist(resid_exp, main = "Histogram of Exponential Resids", xlab = "", col = "sky blue", xlim =
c(-0.5, 0.5))
hist(resid_ricker, main = "Histogram of Ricker Resids", xlab = "", col = "lavender", xlim =
c(-0.7, 0.3))
```

15.