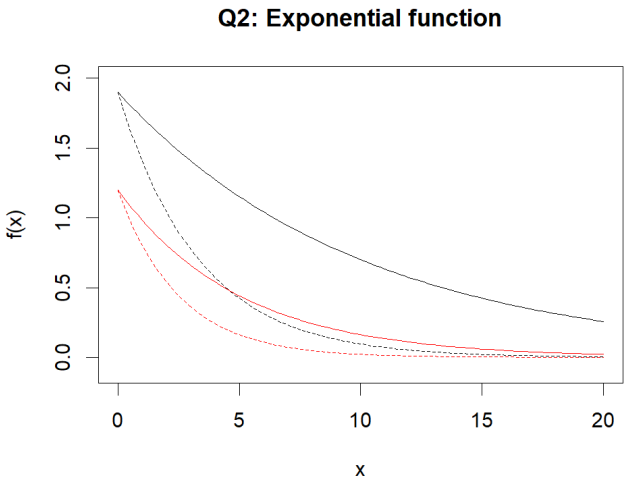
Lab 5 Jackie Stephens

Question 1:

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

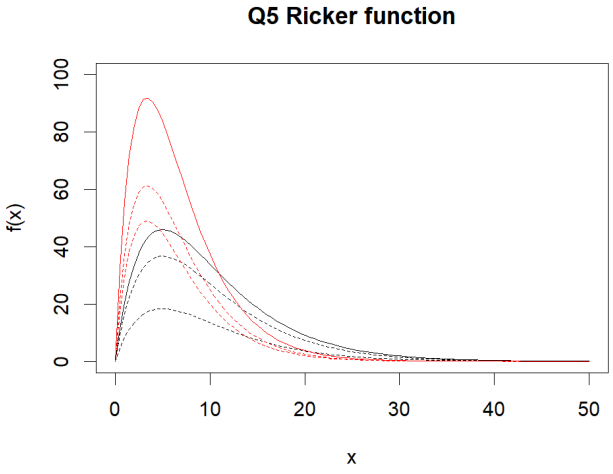
Question 2: see figure to right EF



Question 3: The curve varies as I change the two parameters. When I change the parameter a, the curves start at different f(x)=y values where x = 0. The first two curves started from f(x) = 1.9 and curve 3 and 4 started lower on the y axis at f(x) = 1.2 where x = 0. The parameter a appears to be the y intercept variable.

Question 4: The curves vary as I change the b parameter as well. When I change parameter b, the slope of curves changes. As I increased b from 0.1 to 0.3 for curve 1 and 2, the negative slope of the curve got steeper. The parameter b appears to increase slope when its value is increased, and slope decreases when b is decreased.

Question 5: see figure to right RF

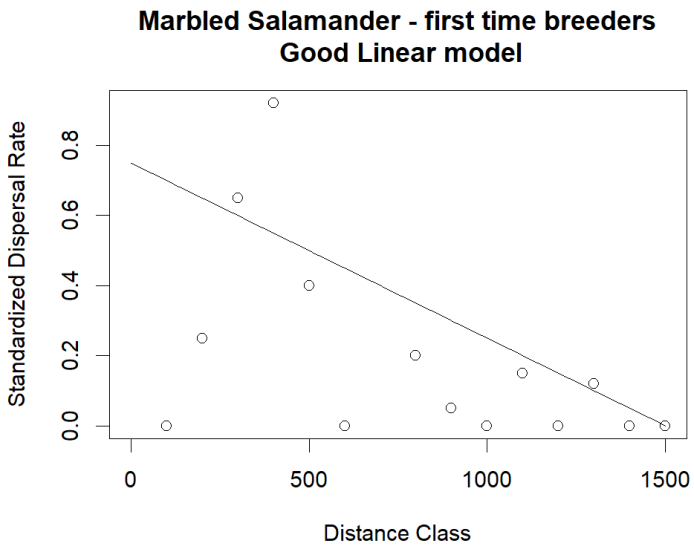


Question 6: The Ricker Function curves vary as I change the two parameters a and b. When I change the parameter a, the initial slopes of the curves change. When I decreased a, the beginning slopes of the curve decreased while if I increased the a of a curve, the initial slopes were increased.

Question 7: The curves for the RF vary as I change the b parameter as well. When I change parameter b, the peak of curves changes. The closer b gets to negative numbers and zero the higher the peak of the curve. This makes sense because a negative b will be multiplied by the -1 in the equation and turn positive giving it a bigger output than a nonnegative number.

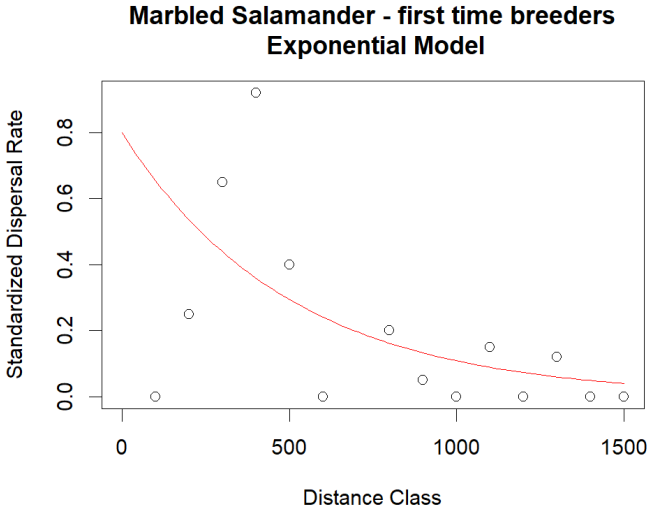
Question 8: For my linear model, the values of slope = -0.0005, x1 = 0, and y1 = 0.75. I chose these parameters because I wanted my linear line to have more of a negative slope to follow the decrease in standardized dispersal rate (SDR) with increasing distance class. I used x1 = 0 and y1 = 0.75 because it seemed like a good start to attempt to incorporate the higher SDRs that occurred around ~400 distance class.

Question 9: see figure to right GLM



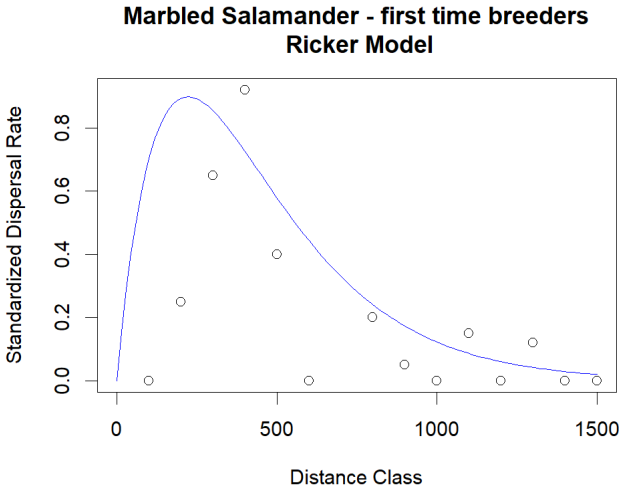
Question 10: For my fitted exponential model, the value of a = 0.8 and b = 0.002. I chose the a parameter as 0.8 because I wanted it to have a y intercept that was relatively higher to again try my best to incorporate the higher SDRs. I chose 0.002 for my b parameter after much trial-and-error testing values and that slope seemed to connect all the data points the best.

Question 11: see figure to right EM(red)



Question 12: For my fitted Ricker model, the value of a = 0.011 and b = 0.0045. I chose these parameters because I wanted the initial slope to more gradual to include the first values but also get near the highest data point. For b = 0.0045, I wanted the peak to be high enough to incorporate the highest data point and slowly tail off, (the closer to zero and negative numbers the higher the exponent will be aka higher the output values)

Question 13: see figure to right RM (blue)



Question 14: Code for data frame of residuals

```
linear_predicted = line_point_slope(dat_MSD$dist.class,0, 0.75, -0.0005)

resids_linear = c(dat_MSD$disp.rate.ftb - linear_predicted)


expon_predicted = exp_fun(dat_MSD$dist.class, 0.8, 0.0020)

resids_expon = c(dat_MSD$disp.rate.ftb - expon_predicted)


ricker_predicted = ricker_fun(dat_MSD$dist.class,  0.011, 0.0045)

resids_ricker = c(dat_MSD$disp.rate.ftb - ricker_predicted)


dat_MSD_MR = data.frame(dat_MSD$disp.rate.ftb,resids_linear, resids_expon, resids_ricker)
```

Question 15: