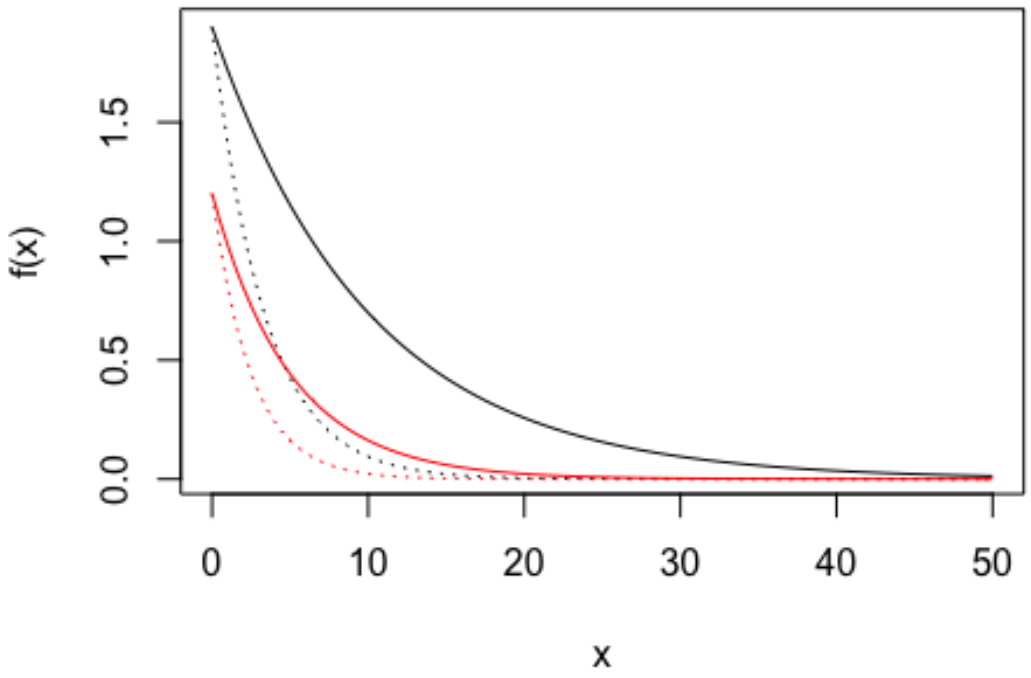
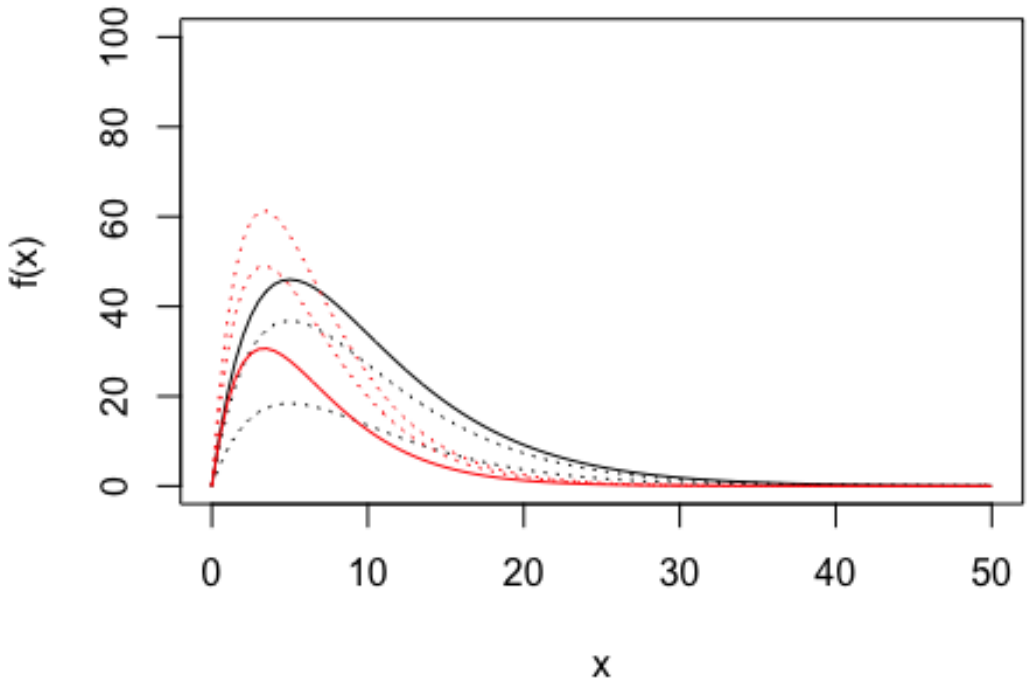
```
Lab 5

Feipeng Huang

#Q1
exp_fun = function(x, a, b)
{
return(a * exp(-b * x))
}
#Q2
```




```
#Q3
#The starting height of the curve varies as I vary parameter a. (bigger a - h
igher starting height)
#Q4
#The rate of decay varies as I vary parameter b. (bigger b - faster decay)
#Q5
```




```
#Q6
#The initial slope varies as I vary parameter a. (bigger a - bigger slope)
#Q7
#The highest point of the curve varies as I vary parameter b. (bigger b -
lower highest point)
```

Q8

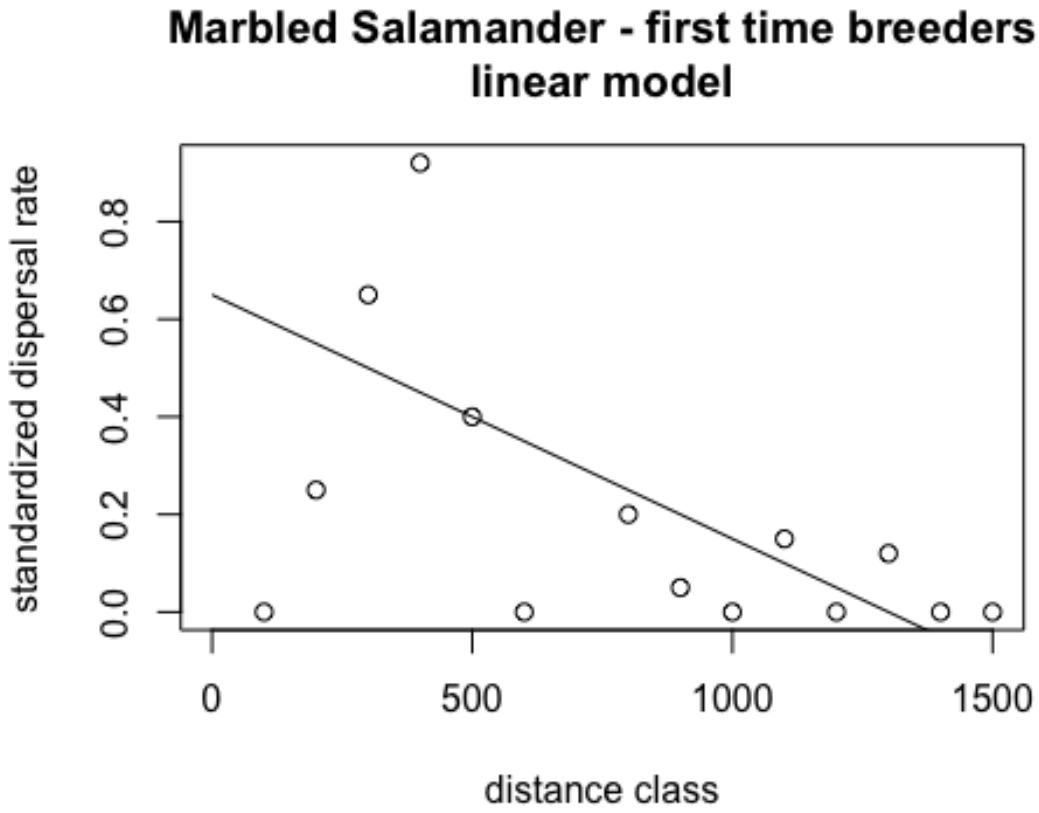
slope = -0.0005

x1 = 500

y1 = 0.4

I first selected a data point to be (x1, y1). There seems to be a downward trend, so I chose a negative slope.

Q9



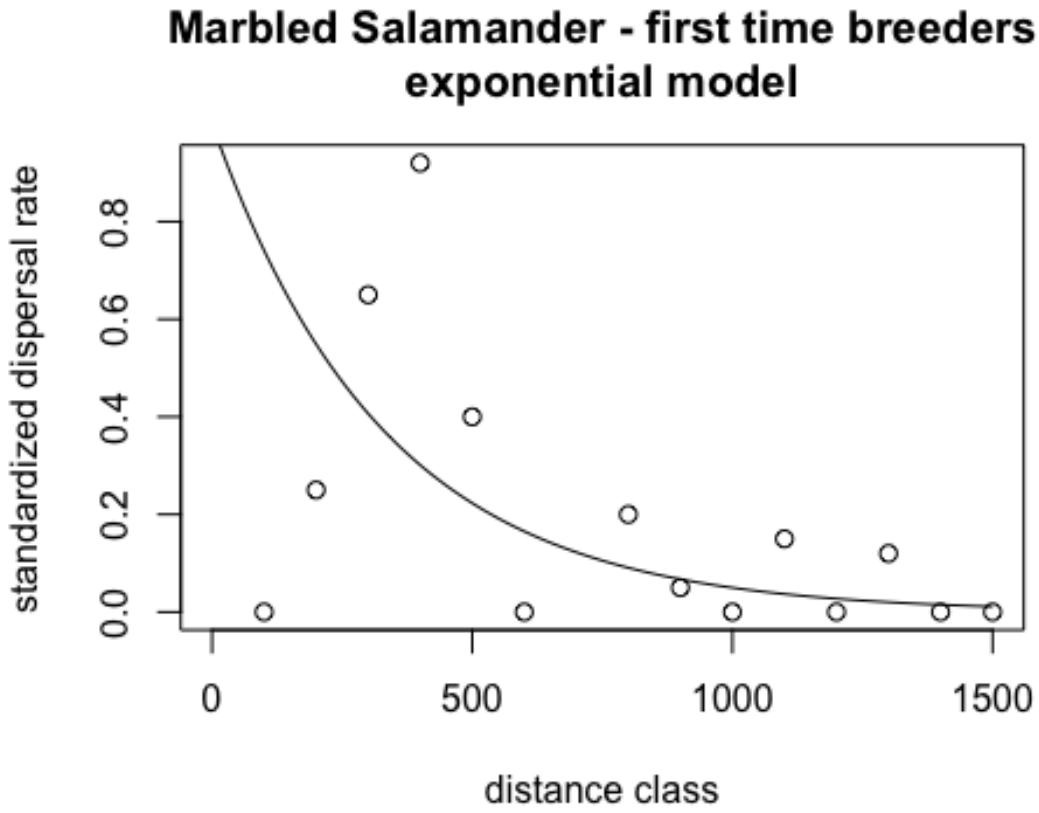
Q10

a = 1

b = 0.003

The highest dispersal rate is 0.92, so I decided a = 1 (the starting height). I set b to 0.003 to best fit the rate of decay.

Q11



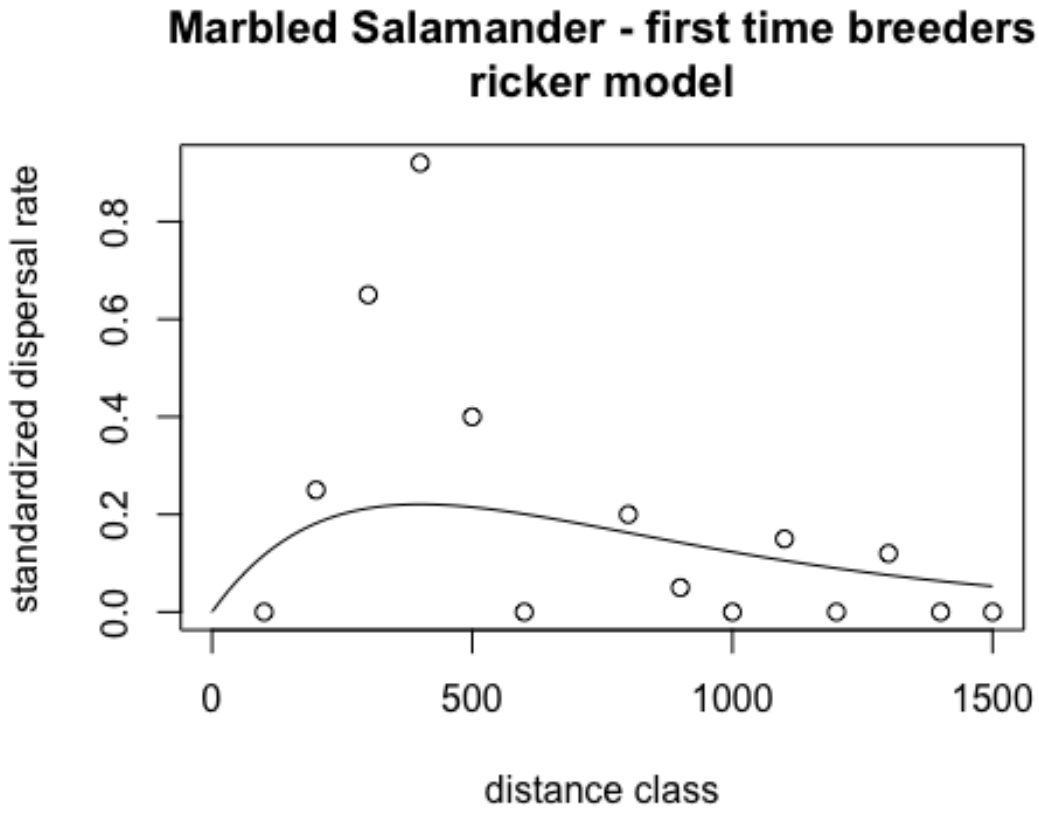
Q12

a = 0.0015

b = 0.0025

The highest point occurs at x = 400. 400 = 1/b, so I set b to 0.0025. I set a to 0.0015 by choosing two nearby points on the far left of the graph and calculating the slope.

Q13

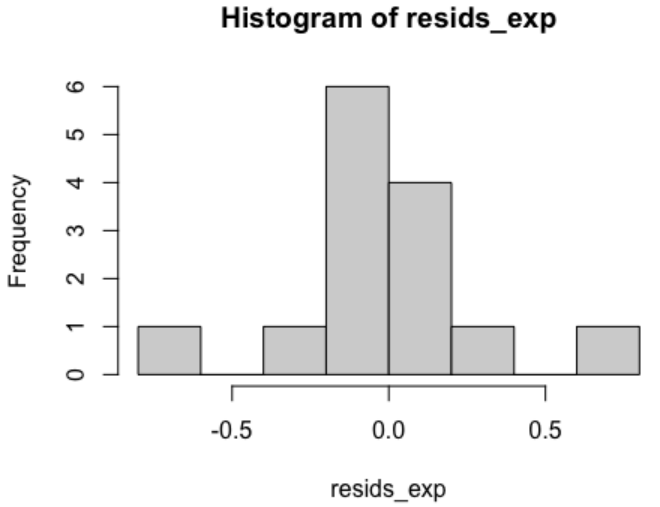


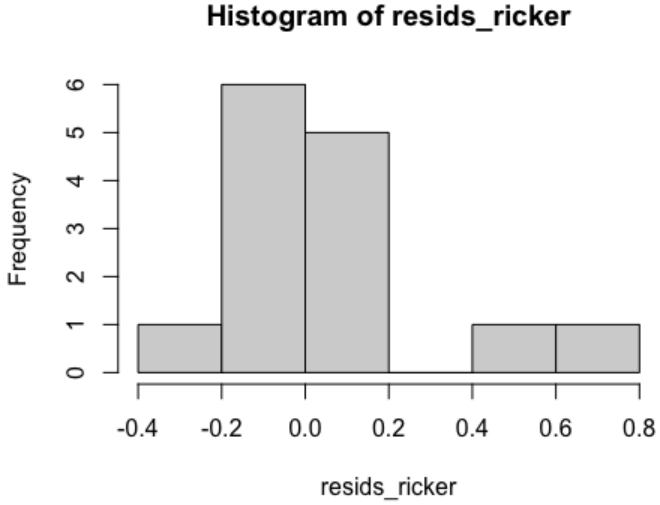
Q14

```
resids_linear =  dat_dispersal$disp.rate.ftb - line_point_slope(dat_dispersal$dist.class, 500, 0.4, -0.0005)
resids_exp = dat_dispersal$disp.rate.ftb - exp_fun(dat_dispersal$dist.class, 1, 0.003)
resids_ricker = dat_dispersal$disp.rate.ftb - ricker_fun(dat_dispersal$dist.class, 0.0015, 0.0025)
df = data.frame(resids_linear, resids_exp, resids_ricker)
```

Q15


Histogram of resids_linear
Frequency
0
1
2
3
4
5
-0.6
-0.4
-0.2
0.0
0.2
0.4
0.6
resids_linear


Histogram of resids_exp
Frequency
0
1
2
3
4
5
6
-0.5
0.0
0.5
resids_exp


Histogram of resids_ricker
Frequency
0
1
2
3
4
5
6
-0.4
-0.2
0.0
0.2
0.4
0.6
0.8
resids_ricker