

6)

```
day<- c(1,2,3,4,5)
N<-c(100,158,315,398,794)
plot(day, log(N))
lm(day ~ log(N))
abline(-7.907, 1.942)
abline(lm(log(N) ~ day))
```

7)

```
install.packages('deSolve')
library(deSolve)
ecology <- function(t, y, p) {
  N <- y[1]
  with(as.list(p), {
    dN.dt <- r * N
    return(list(dN.dt))
  })
}
t <- 1:100
y0 <- c('N' = 1)
p <- c('r' = 0.25)
p2 <- c('r' = 0.5)
p3 <- c('r' = 1)

sim1 <- ode(y = y0, times = t, func = ecology, parms = p, method = 'lsoda')
sim2 <- ode(y = y0, times = t, func = ecology, parms = p2, method = 'lsoda')
sim3 <- ode(y = y0, times = t, func = ecology, parms = p3, method = 'lsoda')
```

```
head(sim1)
class(sim1)
sim1.frame <- as.data.frame(sim1)
names(sim1.frame)
names(sim1.frame) <- c('t', 'abundance')
sim1.frame$t
sim1.frame$abundance
```

```
head(sim2)
class(sim2)
sim2.frame <- as.data.frame(sim2)
names(sim2.frame)
names(sim2.frame) <- c('t', 'abundance')
sim2.frame$t
sim2.frame$abundance
```

```
head(sim3)
class(sim3)
sim3.frame <- as.data.frame(sim3)
names(sim3.frame)
names(sim3.frame) <- c('t', 'abundance')
sim3.frame$t
sim3.frame$abundance
```

```
plot(abundance ~ t, data = sim1.frame, type = 'l', lwd = 3, col = 'purple', bty = 'l')
lines(abundance ~ t, data = sim2.frame, type = 'l', lwd = 3, col = 'red', bty = 'l')
lines(abundance ~ t, data = sim3.frame, type = 'l', lwd = 3, col = 'green', bty = 'l')
```

?points

?legend

```
legend(60, 4e+10, c("r = 0.25", "r = 0.5", "r = 1"), lty=c(1,1,1), lwd=c(2.5, 2.5, 2.5), col=c("purple", "red",  
"green"))
```