1.

a) log(5)

b) e

c) log(-5), NaN logs can only take positive numbers

d) sqrt(5)

2.

a) x <- sample(1:1000,15,replace=TRUE)

sd(x)

mean(x)

b) x <- rnorm(15,mean=10,sd=2)

sd(x)

mean(x)

c)

The differences can be explained by rounding errors

and approximation to allow for greater randomness in number generation.

3.

w <- c(60, 72, 57, 90, 95, 72)

h <- c(1.80, 1.85, 1.72, 1.90, 1.74, 1.91)

plot(h,w, main="Height vs. Weight", xlab="Height", ylab="Weight")

BMI <- w/sqrt(h)

meanw <- mean(w)

subw <- w-meanw

sumw <- sum(subw)

4.

cat <- c("prog", "math", "stat", "mlrn", "DE", "comm", "dvis")

score <- c(3, 4, 4, 2, 3, 3, 2)

profile <- data.frame(score, cat)

barplot(profile$score, profile$cat, horiz=TRUE, main="Data Science Profile", xlab="categories", ylab="score")

5.

**Swirl 1**

> 5+7

> x <- 5+7

> x

> y <-x-3

> y

> z <- c(1.1, 9, 3.14)

> z

> c(z,555,z)

> z\*2+100

> my\_sqrt <- sqrt(z-1)

> my\_sqrt

> my\_div = my\_sqrt/z

> my\_div <- my\_sqrt/z

> my\_div <- z/my\_sqrt

> my\_div

> c(1,2,3,4)+c(0,10)

> c(1, 2, 3, 4) + c(0, 10, 100)

> z\*2+1000

> my\_div

**Swirl 2**

getwd()

ls()

x <- 9

dir()

?list.files

args(list.files)

dir.create("testdir")

setwd("testdir")

file.create("mytest.R")

list.files()

file.exists("mytest.R"

file.info("mytest.R")

file.rename("mytest.R","mytest2.R")

file.copy("mytest2.R","mytest3.R")

file.path("mytest3.R")

dir.create(file.path('testdir2', 'testdir3'), recursive = TRUE)

setwd(old.dir)

**Swirl 3**

1:20

pi:10

15:1

?':'

seq(1,20)

seq(0,10,by=0.5)

seq(5,10,length=30)

my\_seq <- seq(5, 10, length=30)

length(my\_seq)

seq\_along(my\_seq)

rep(0, times = 40)

rep(c(0, 1, 2), times = 10)

rep(c(0, 1, 2), each =10

**Swirl 4**

num\_vect <- c(0.5, 55, -10, 6)

tf <- num\_vect<1

tf

num\_vect>=6

my\_char <- c("My", "name", "is")

my\_char

paste(my\_char, collapse = " ")

c(my\_char, "Jonathan")

my\_name <- c(my\_char, "jon")

my\_name

paste(my\_name, collapse = " ")

paste("Hello", "world!", sep = " ")

paste(1:3, c("X", "Y", "Z"), sep = "")

paste(LETTERS, 1:4, sep = "-")

**Swirl 5**

x <- c(44, NA, 5, NA)

x\*3

y <- rnorm(1000)

z <- rep(NA, 1000)

my\_data <- sample(c(y, z), 100)

my\_na <- is.na(my\_data)

my\_na

my\_data == NA

sum(my\_na)

my\_data

0/0

Inf-Inf

**Swirl 6**

x

x[1:10]

x[is.na(x)]

y <- x[!is.na(x)]

y

y[y>0]

x[x>0]

x[!is.na(x) & x>0]

x[c(3,5,7)]

x[0]

x[3000]

x[c(-2, -10)]

x[-c(2, 10)]

vect <- c(foo = 11, bar = 2, norf = NA)

vect

names(vect)

vect2 <- c(11, 2, NA)

names(vect2) <- c("foo", "bar", "norf")

identical(vect, vect2)

vect["bar"]

vect[c("foo", "bar")]

**Swirl 7**

my\_vector <- 1:20

my\_vector

dim(my\_vector)

length(my\_vector)

dim(my\_vector) <- c(4, 5)

dim(my\_vector)

attributes(my\_vector)

my\_vector

class(my\_vector)

my\_matrix <- my\_vector

?matrix

matrix(data=1:20, nrow=4, ncol=5)

identical(my\_matrix,my\_matrix2)

my\_matrix2 <-cbind(patients)

cbind(patients, my\_matrix)

my\_data <- data.frame(patients, my\_matrix)

class(my\_data)

cnames <- c("patient", "age", "weight", "bp", "rating", "test")

colnames(my\_data) <- cnames