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##1

#The log of a positive number.

log(50)

#The default base for the log function

print("e = 2.718 281 828")

#log with a different base.

log(50,10)

#log of a negative number. (explain the answer)

log(-1) #returns NaN, Not a Number

#Square-root of a positive number.

sqrt(49)

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##2

#standard random normal vector of n=15

vec <- rnorm(15)

#its mean

mean(vec)

#its stdDev

sd(vec)

#random vector with a target mean and sd

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

#should be close to 2

sd(vec)

#should be close to 10

mean(vec)

## Note: They will not be exact but can be made more accurate with increased sample size. 15 is insufficient, 30 is the standard

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##3

#weights vector

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

#heights vector

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

#plot weight vs height

plot(weights ~ heights)

#calc BMI for each unit of sample

BMI <- weights / heights\*\*2

#sample mean

wgtMean <- mean(weights)

#subtract sample average from every sample element

weights <- weights - wgtMean