Gain access to R: Here are a couple of options (any one will do):

a) Install R on your home computer. See the “Links to Resources” button on the course webpage.

b) Run it on a UW computer. It is available on CSSCR computer labs (http://julius.csscr.washington.edu), for example.

c) Use Rweb from a browser. A web-accessible version of R is available from the “Links to Resources” button on the course webpage. The direct address is http://www.math.montana.edu/Rweb/Rweb.general.html

This last one is sufficient for the homework.

For the numbers
7.3 6.8 0.005 9 12 2.4 18.9 0.9

a) Find their mean.

b) Subtract the mean from each number.

c) Calculate the square roots of the numbers.

d) Print those numbers which are larger than their square roots.

3) Put n <- 10 and compare the sequences 1:n-1 and 1:(n-1). Why are they different?

4) Use the seq and rep functions to produce a vector containing:

a) the values: 1, 2, 3, 4, 1, 2, 3, 4, 1, 2, 3, 4;

b) the values: 4, 4, 4, 4, 3, 3, 3, 3, 2, 2, 2, 2, 1, 1, 1, 1;

c) the values: 1, 2, 2, 3, 3, 3, 4, 4, 4, 4, 4, 5, 5, 5, 5, 5; and

d) the values: 1, 1, 3, 3, 5, 5, 7, 7, 9, 9.

5) Suppose you have an object, X, containing some numbers ranging from 0 to 100 (maybe repeated). Now you would like to create another object Y from X in such a way that all numbers which are less than 10 or greater than 90 must be excluded. How can you do that?

7) Consider the two matrices M1

\[
\begin{bmatrix}
[,1] & [,2] \\
[1,] & 1 & 2 \\
[2,] & 2 & 1 \\
\end{bmatrix}
\]

and M2

\[
\begin{bmatrix}
[1,] & 3 & 5 & 7 \\
[2,] & 4 & 6 & 8 \\
\end{bmatrix}
\]

a) Create M1 and M2 in S-Plus.

b) Multiply M1 by itself element by element, and by matrix multiplication.

c) Multiply M1 by M2, and multiply the transpose of M2 by M1.

8) If you are using S-Plus do the following question: Consider the data from the New Jersey Pick-it Lottery, which are in S-Plus under the names lottery.number and lottery.payoff.

a) Find which winning numbers had payoffs of more than $500.

b) Find the 10 smallest payoffs and the corresponding “unlucky” numbers. Hint: the function order is helpful.

9) If you are using R do the following question: Consider the violent crime statistics for the USA available in the sample data set USArrests. They are in R under the name USArrests (hint: Read about the data() command).

a) Use the data command to load the data into R.

b) Find which states had more than 15 murders per 100,000 people.

c) Find the 10 states with the lowest percent urban population and their corresponding assault arrests per 100,000 population. Hint: the function order is helpful.