5.1

Consider the samples 1-6. Use a six-sided die to obtain three different bootstrap samples and their corresponding means.

```
pop <- seq(from = 1, to = 6, by = 1)

n <- 6

s1 <- mean( sample(pop, n, replace = T) )
s2 <- mean( sample(pop, n, replace = T) )
s3 <- mean( sample(pop, n, replace = T) )
```

$\bar{x}_1^* = 2.6666667, \bar{x}_2^* = 2.5, \bar{x}_3^* = 4.5$

5.2

Consider the samples 1, 3, 4, and 6 from some distribution.

a.) For one random bootstrap sample, find the probability that the mean is one.

b.) For one random bootstrap sample, find the probability that the maximum is 6.

c.) For one random bootstrap sample, find the probability that exactly two elements in the sample are less than 2.

5.3

Consider the sample 1-3.

a.) List all the (ordered) bootstrap samples from this sample. How many are there?

b.) How many unordered bootstrap samples are there? For example, {1, 2, 2} and {2, 1, 2} are considered to be the same.

c.) How many ordered bootstrap samples have one occurrence of 1 and two occurences of 3?

Is this the same number of bootstrap samples that have each of 1, 2 and 3 occuring exactly once?

d.) Is the probability of obtaining a bootstrap sample with one 1 and two 3's the same as the probabiliity of obtaining a bootstrap sample with each of 1, 2 and 3 occuring exactly once?