Assignment #10 contains several textbook problems from Chapters 8 and 9. Here are the assigned problems from the textbook.

From Chapter 8, problems 8.9 and 8.11.


There are 7 problems, so this assignment is worth 35 HW points.

You should use R to solve the starred problems in addition to solving them by hand (a calculator and the formula).

Here is some sample R code to solve problem 9.49.

```r
> placebo = c(105, 119, 92, 97, 96, 101, 94, 95, 98)
> caffeine = c(96, 99, 89, 95, 88, 95, 88, 93, 88)
> t.test(placebo, caffeine, paired = T)

Paired t-test

data: placebo and caffeine
t = 3.9355, df = 8, p-value = 0.004323
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
  3.036348 11.630318
sample estimates:
mean of the differences
  7.333333
```

Here is how you could use R for a one-sided sign test.

```r
> s = sign(placebo - caffeine)
> n = sum(s != 0)
> numPositive = sum(s > 0)
> sum(dbinom(numPositive:n, n, 0.5))

[1] 0.001953125
```

Finally, here is built in R code for a permutation test.

```r
> library(exactRankTests)
> perm.test(placebo, caffeine, paired = T, alternative = "greater")

1-sample Permutation Test

data: placebo and caffeine
T = 66, p-value = 0.001953
alternative hypothesis: true mu is greater than 0
```