

Chapter 7 Homework

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Problem 7.7 b)

```
#T_U
qchisq((1-0.05)/2, 149)

## [1] 147.2568

#T_L
qchisq(0.05/2, 149)

## [1] 117.098

#Lower End
(149)*(9.537^2)/(147.2568)

## [1] 92.03107

#Upper End
(149)*(9.537^2)/(117.098)

## [1] 115.7338
```

Problem 7.7 c)

```
#chisquare value
(149*9.537^2)/(9^2)

## [1] 167.3111

#upper val in Chi Sq test
qchisq(0.99, 149)

## [1] 192.073

#probability in the right tail of our chi-sq dist
1-pchisq(167.3111, 149)

## [1] 0.1449358
```

Problem 7.16 a) and b)

```
f <- (53.77^2)/(36.94^2)
sqrt((1.58*f))

## [1] 1.829665

sqrt((1/1.58)*f)

## [1] 1.158016
```

```
# part b test stat
f

## [1] 2.118782
# part b p-value
1- pf(2.1188, 90, 90)

## [1] 0.0002228897
```

7.16 c) Satterwhaite's Approximation

```
kk <- (53.77^2)/(91)
kk

## [1] 31.77157
jj <- (36.94^2)/(91)
jj

## [1] 14.9952
kk^2/90

## [1] 11.21592
jj^2/90

## [1] 2.498402
31.7716+14.9952

## [1] 46.7668
11.2159+2.4984

## [1] 13.7143
46.7668/13.7143

## [1] 3.410076
```

7.16 d) p-value

```
pt(-0.4284, df = 3)

## [1] 0.3486281
```

7.18 BFL test for Wild Ranch and Zoo group

```
library(lawstat)
library(reshape2)
library(tidyverse)
wild <- c(114.7, 128.9, 111.5, 116.4, 134.5, 126.7, 120.6, 129.59)
ranch <- c(120.4, 91.0, 119.6, 119.4, 150.0, 169.7, 100.9, 76.1)
zoo <- c(103.1, 90.7, 129.5, 75.8, 182.5, 76.8, 87.3, 77.3)
weight_m <- matrix(c(wild, ranch, zoo), nrow = 8, ncol = 3, byrow = F)
```

```
weight <- data.frame(weight_m)
colnames(weight) <- c("wild", "ranch", "zoo")
weight <- melt(weight)
levene.test(y = weight$value, group = weight$variable, location = "median")
```

```
##
##  modified robust Brown-Forsythe Levene-type test based on the
##  absolute deviations from the median
##
## data:  weight$value
## Test Statistic = 1.4392, p-value = 0.2596
```