§ **Ex2. F = 3.2 ~ $F_{3, 194}$**

一. **Ex.2 Code**

```
getwd()
setwd("/Users/raymond/Desktop/R")
# Ex2. F statistic = 3.2(right-tailed test). df1 = 3, df2 = 194

  # pdf
  x <- seq(0, 10, 0.01)
  y_df <- df(x, df1 = 3, df2 = 194, log = FALSE)
  png(filename = "hw1.ex2-1.png", width = 750, height = 720, res = 120)
  plot(x, y_df, type = "l", lwd = 3,
     ylab = "y", main = "Probability Density Function",
     cex.main = 2, cex.lab = 1.5)
  axis(1, at = seq(round(min(x)), round(max(x)), by = 1),
     labels = seq(round(min(x)), round(max(x)), by = 1))
  mtext("F test, df1 = 3, df2 = 194", side = 3, adj = 1, cex = 1)
  dev.off()

  # cdf
  x <- seq(0, 10, 0.01)
  y_pf <- pf(x, df1 = 3, df2 = 194)
  png(filename = "hw1.ex2-2.png", width = 750, height = 720, res = 120)
  plot(x, y_pf, type = "l", lwd = 3,
     ylab = "y", main = "Cumulative Distribution Function",
     cex.main = 2, cex.lab = 1.5)
  axis(1, at = seq(round(min(x)), round(max(x)), by = 1),
     labels = seq(round(min(x)), round(max(x)), by = 1))
  mtext("F test, df1 = 3, df2 = 194", side = 3, adj = 1, cex = 1)
  dev.off()

  #p-value
  options(digits = 3)
  (y_pf <- pf(3.2, df1 = 3, df2 = 194, lower = FALSE))
     #p_value = y_pf = 0.0245, since this test being one-tailed
```

二. Ex.2 Plot

Probability Density Function — F test, df1 = 3, df2 = 194

Cumulative Distribution Function — F test, df1 = 3, df2 = 194
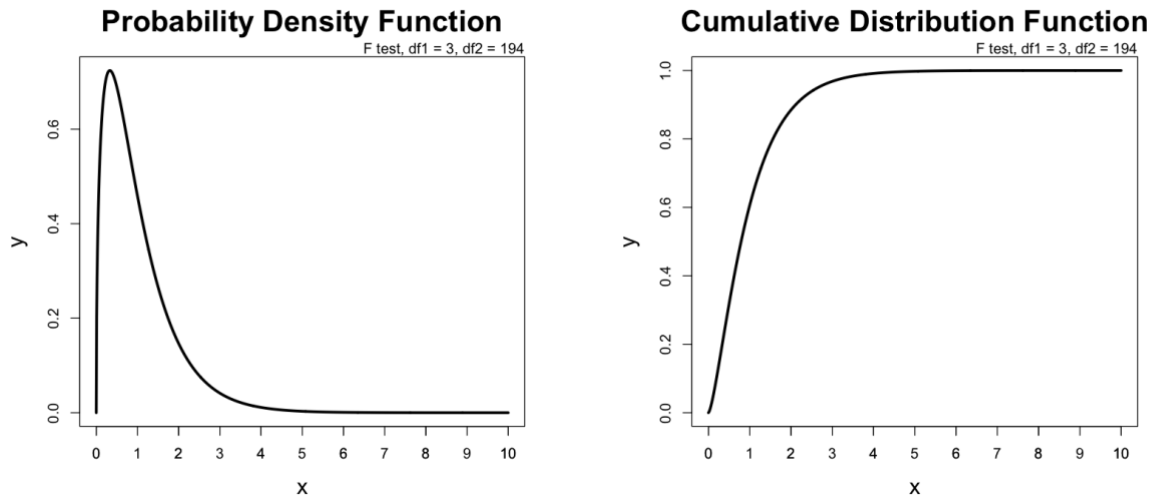
§   **Ex.3-1 T = -2.08 ~ t $_{df = 136}$**

一. **Ex.3-1 code**

#Ex.3-1 t-test statistic = -2.08 (two-tailed test), df = 136

```
  #p-value
  y_pt <- pt(-2.08, df = 136)
  options(digits = 3)
  (p_value <- y_pt * 2)
    #p_value = y_pt * 2 = 0.0394, since this test being two-tailed
```

§   **Ex.3-2 T = 2.45 ~ t $_{df = 136}$**

一. **Ex.3-2 code**

#Ex. 3-2 t-test statistic = 2.45 (two-tailed test), df = 136

```
  #p-value
  y_pt <- pt(2.45, df = 136, lower.tail = FALSE)
  options(digits = 3)
  (p_value <- y_pt * 2)
    #p-value = y_pt * 2 = 0.0156, since this test being two-tailed

  #pdf
  x <- seq(-5, 5, 0.01)
  y_dt <- dt(x, 136, log = FALSE)
  png(filename = "hw1.ex3-1.png", width = 750, height = 720, res = 120)
  plot(x, y_dt, type = "l", lwd = 3,
     ylab = "y", main = "Probability Density Function",
     cex.main = 2, cex.lab = 1.5)
  axis(1, at = seq(round(min(x)), round(max(x)), by = 1),
     labels = seq(round(min(x)), round(max(x)), by = 1))
```

```
mtext("t-test, df = 136", side = 3, adj = 1, cex = 1)
dev.off()



#cdf
x <- seq(-5, 5, 0.01)
y_pt <- pt(x, df = 136)
png(filename = "hw1.ex3-2.png", width = 750, height = 720, res = 120)
plot(x, y_pt, type = "l", lwd = 3,
    ylab = "y", main = "Cumulative Distribution Function",
    cex.main = 2, cex.lab = 1.5)
axis(1, at = seq(round(min(x)), round(max(x)), by = 1),
    labels = seq(round(min(x)), round(max(x)), by = 1))
mtext("t-test, df = 136", side = 3, adj = 1, cex = 1)
dev.off()
```

二. **Ex.3-2 plot**