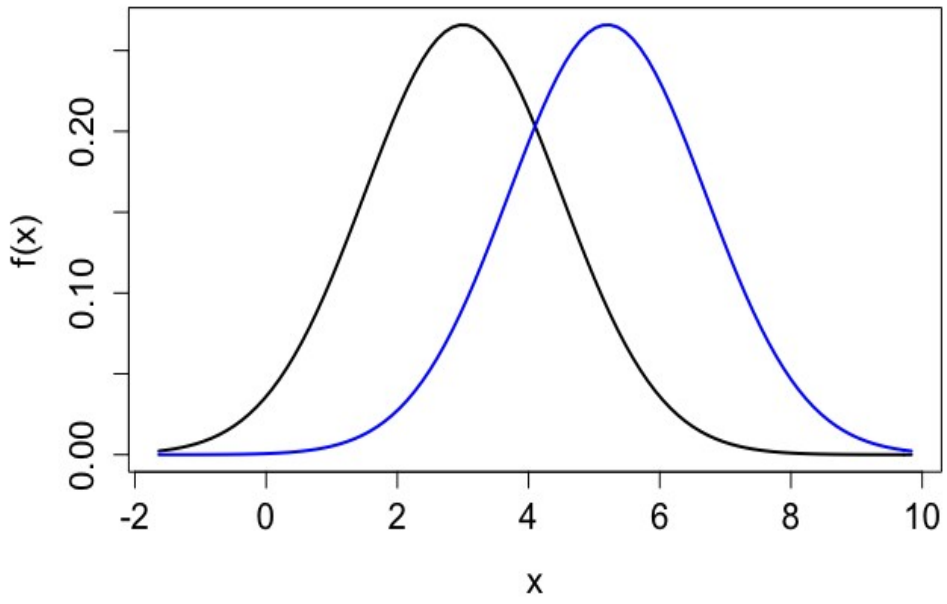
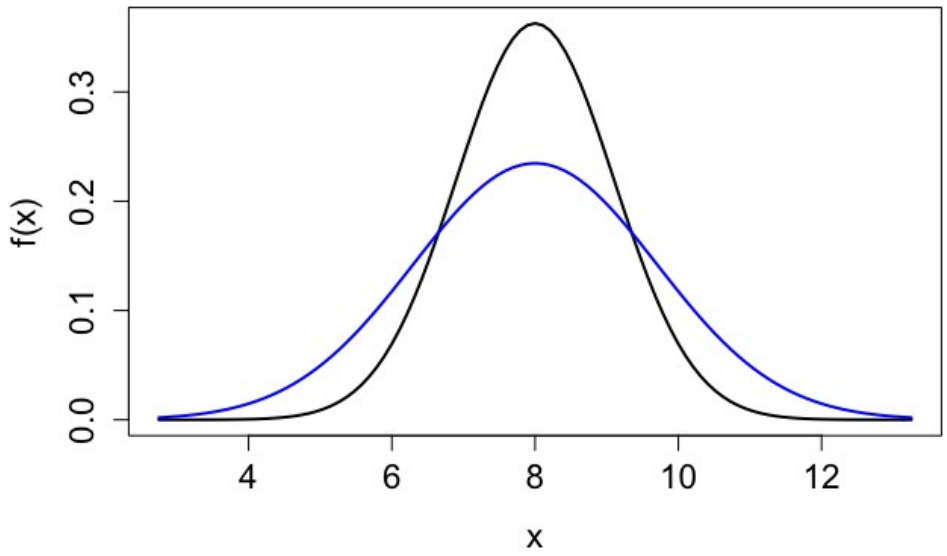
Distribuições contínuas na linguagem R

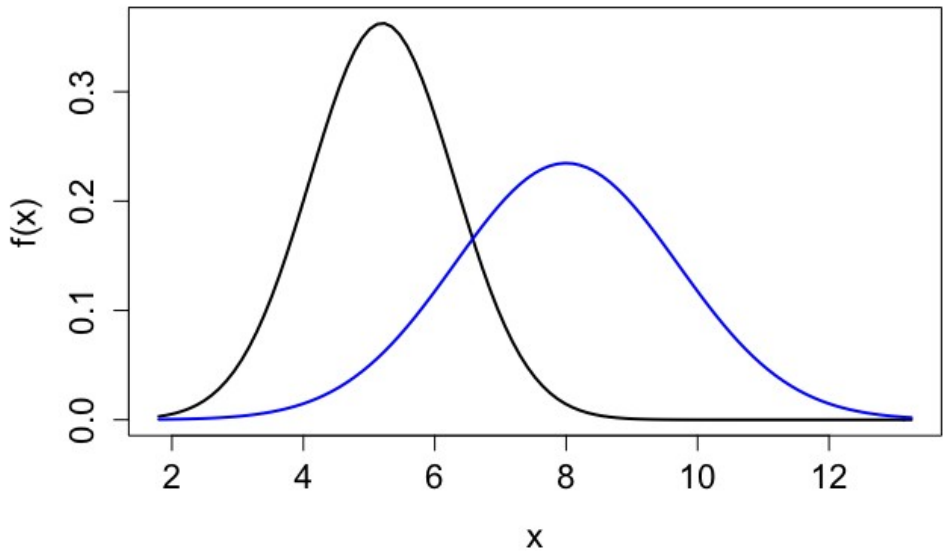
```
# 1. Distribuição normal

# Diferentes médias
mean1 <- 3
mean2 <- 5.2
sd1 <- 1.5

curve(dnorm(x, mean = mean1, sd = sd1), xlab = "x", ylab = "f(x)",
   from = qnorm(0.001, mean1, sd1), to = qnorm(0.999, mean2, sd1),
   lwd = 2, cex.axis = 1.4, cex.lab = 1.4)
curve(dnorm(x, mean = mean2, sd = sd1), add = TRUE, col = "blue",
      lwd = 2)
```



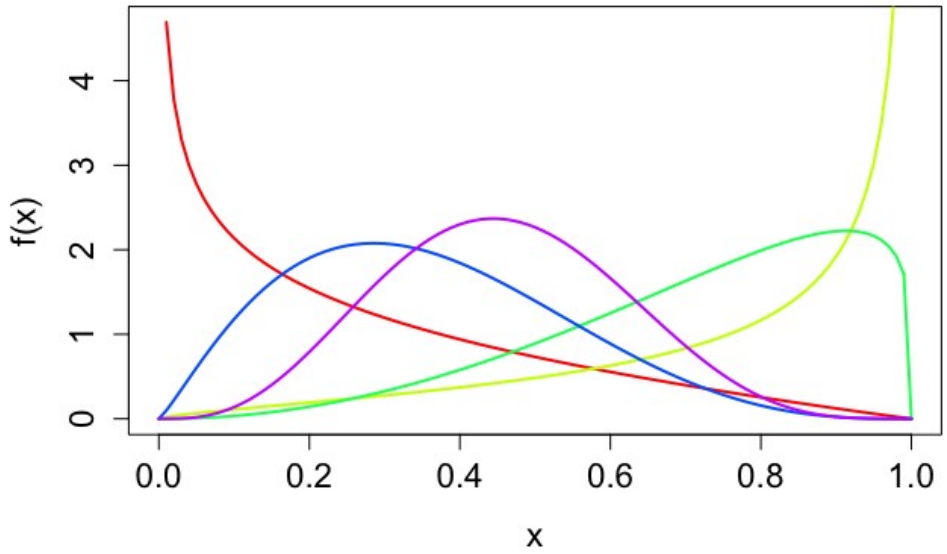

```
# Diferentes desvios padrão
mean1 <- 8
sd1 <- 1.1
sd2 <- 1.7
curve(dnorm(x, mean = mean1, sd = sd1), xlab = "x", ylab = "f(x)",
      from = qnorm(0.001, mean1, sd2), to = qnorm(0.999, mean1, sd2),
      lwd = 2, cex.axis = 1.4, cex.lab = 1.4)
curve(dnorm(x, mean = mean1, sd = sd2), add = TRUE, col = "blue",
      lwd = 2)
```



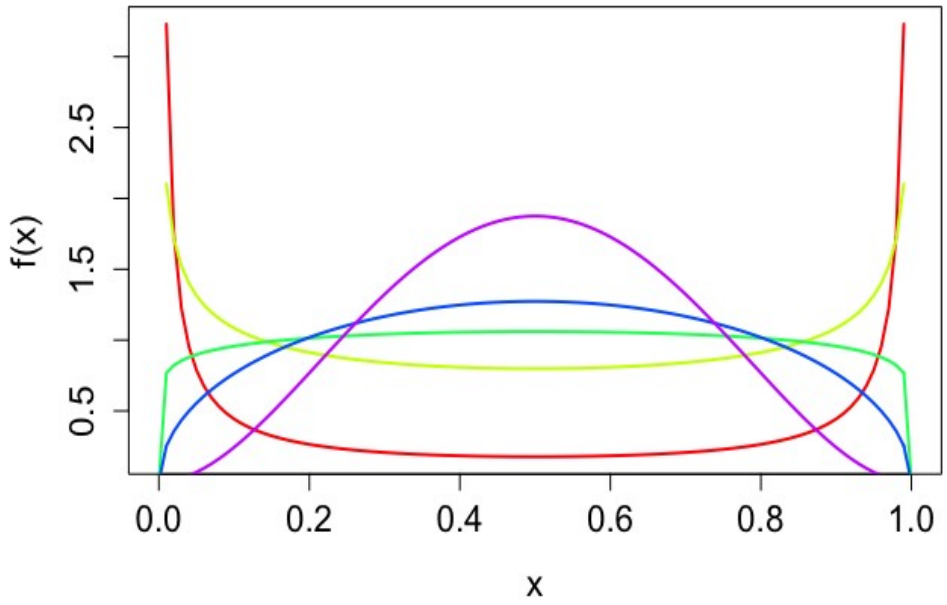

```
# Diferentes médias e desvios padrão
mean1 <- 5.2
mean2 <- 8
sd1 <- 1.1
sd2 <- 1.7

xmin <- min(qnorm(0.001, mean1, sd1), qnorm(0.001, mean2, sd2))
xmax <- max(qnorm(0.999, mean1, sd1), qnorm(0.999, mean2, sd2))

curve(dnorm(x, mean = mean1, sd = sd1), xlab = "x", ylab = "f(x)",
      from = xmin, to = xmax, lwd = 2, cex.axis = 1.4, cex.lab = 1.4)
curve(dnorm(x, mean = mean2, sd = sd2), add = TRUE, col = "blue",
      lwd = 2)
```



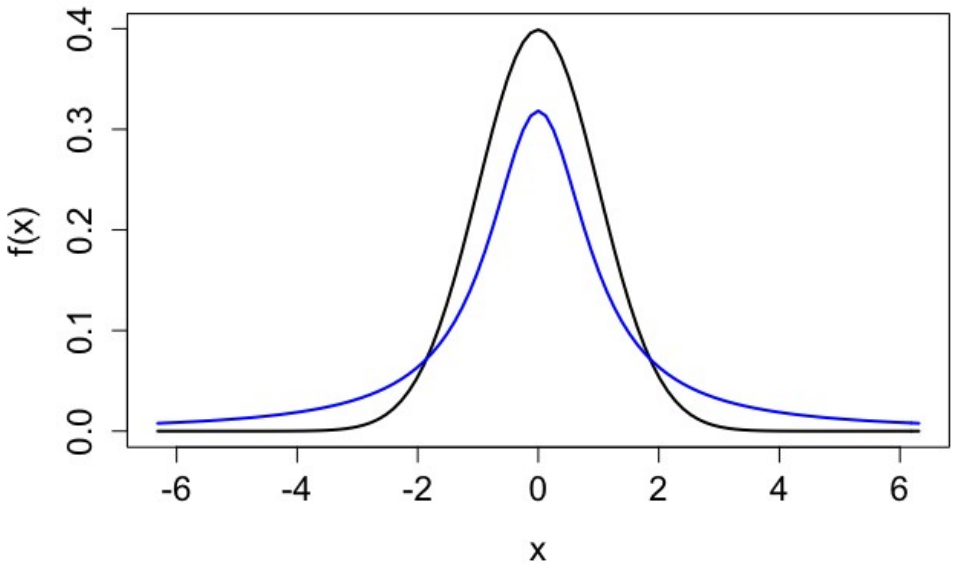
```
# 2. Distribuição beta

# Assimétricas
mycolors <- rainbow(5)
curve(dbeta(x, shape1 = 0.7, shape2 = 2), xlab = "x", ylab = "f(x)",
      lwd = 2, cex.axis = 1.4, cex.lab = 1.4, col = mycolors[1])
curve(dbeta(x, shape1 = 1.7, shape2 = 0.4), add = TRUE, lwd = 2,
      col = mycolors[2])
curve(dbeta(x, shape1 = 3.1, shape2 = 1.2), add = TRUE, lwd = 2,
      col = mycolors[3])
curve(dbeta(x, shape1 = 2.2, shape2 = 4), add = TRUE, lwd = 2,
      col = mycolors[4])
curve(dbeta(x, shape1 = 4.2, shape2 = 5), add = TRUE, lwd = 2,
      col = mycolors[5])
```



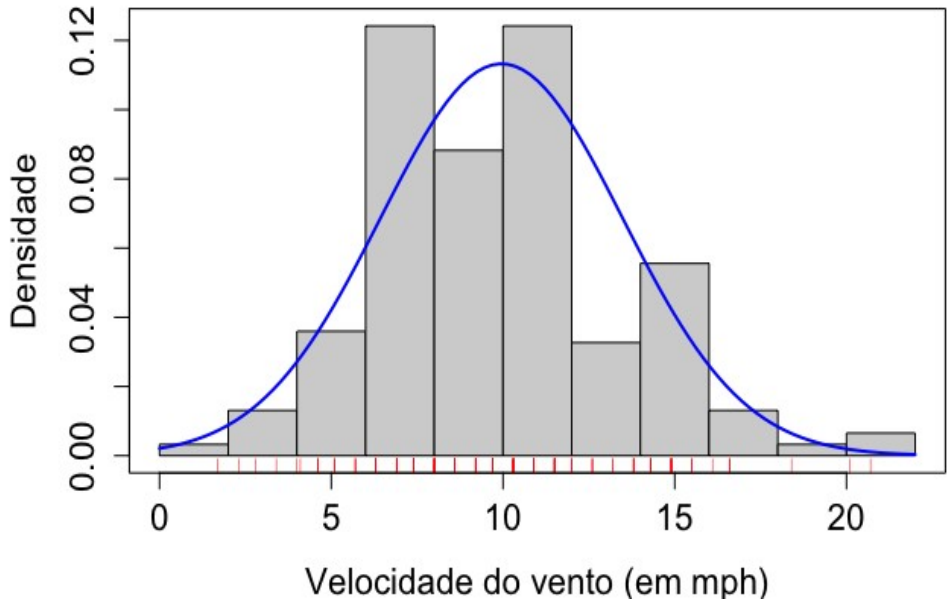

```
# Simétricas (shape1 = shape2)
mycolors <- rainbow(5)
curve(dbeta(x, shape1 = 0.1, shape2 = 0.1), xlab = "x", ylab =
"f(x)",
      lwd = 2, cex.axis = 1.4, cex.lab = 1.4, col = mycolors[1])
curve(dbeta(x, shape1 = 0.7, shape2 = 0.7), add = TRUE, lwd = 2,
      col = mycolors[2])
curve(dbeta(x, shape1 = 1.1, shape2 = 1.1), add = TRUE, lwd = 2,
      col = mycolors[3])
curve(dbeta(x, shape1 = 1.5, shape2 = 1.5), add = TRUE, lwd = 2,
      col = mycolors[4])
curve(dbeta(x, shape1 = 3, shape2 = 3), add = TRUE, lwd = 2,
      col = mycolors[5])
```




```
# 3. Distribuições normal e Cauchy padrão
curve(dnorm(x, mean = 0, sd = 1), xlab = "x", ylab = "f(x)",
      from = qcauchy(0.05, location = 0, scale = 1),
       to = qcauchy(0.95, location = 0, scale = 1), lwd = 2, cex.axis
= 1.4, cex.lab = 1.4)
curve(dcauchy(x, location = 0, scale = 1), add = TRUE, col = "blue",
      lwd = 2)
```



```
# 4. Exemplo com a distribuição normal
# Velocidade do vento (em mph)
mydata <- airquality[,3]
xm <- mean(mydata)
sig <- sd(mydata)

cat("\n Número de observações:", length(mydata))

Número de observações: 153

cat("\n Estimativas dos parâmetros (mu e sigma):", c(xm, sig))

Estimativas dos parâmetros (mu e sigma): 9.957516 3.523001

hist(mydata, freq = FALSE, main = "", cex.axis = 1.4, cex.lab = 1.4,
     col = "lightgray", xlab = "Velocidade do vento (em mph)",
     ylab = "Densidade")
curve(dnorm(x, mean = xm, sd = sig), add = TRUE, col = "blue",
      lwd = 2)
rug(mydata, col = "red")
box()
```



Nota 1. Escreva comandos para incluir legendas em todos os gráficos.

Nota 2. Diversas distribuições de probabilidade, tanto discretas quanto contínuas, estão disponíveis na linguagem R e estão descritas na página *CRAN Task View: Probability Distributions* (https://cran.r-project.org/web/views/Distributions.html).