

Exercício 6

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```
library(ggplot2) #Representação grafica
library(dplyr)
```

```
set.seed(1823)
```

```
n4 <- data.frame(m4 = c(replicate(200,mean(runif(4,min = 7,max = 11))))
n29 <- data.frame(m29 = c(replicate(200,mean(runif(29,min = 7,max = 11))))
n64 <- data.frame(m64 = c(replicate(200,mean(runif(64,min = 7,max = 11))))
```

```
plot <- ggplot(n4, aes(x=m4)) +
  geom_histogram(aes(y = after_stat(count / sum(count))),color="black",fill="#FCA311")+
  labs(x = "Valor",y = "Frequência Relativa") +
  ggtitle("n=4") +
  stat_function(fun = dnorm, args = list(mean = (7+11)/2, sd = sqrt((11-7)^2/(12*4))))+
  theme(panel.background = element_rect(fill = "white", colour = "black",
    size = 0, linetype = "solid"),
    panel.grid.major = element_line(size = 0.5, linetype = 'solid',
    colour = "grey"),
    panel.grid.minor = element_line(size = 0.25, linetype = 'solid',
    colour = "white"))
```

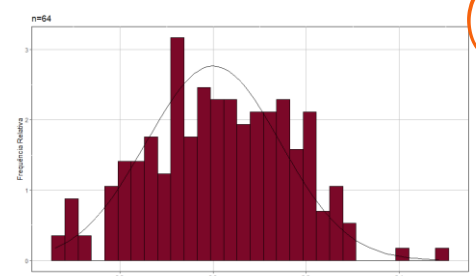
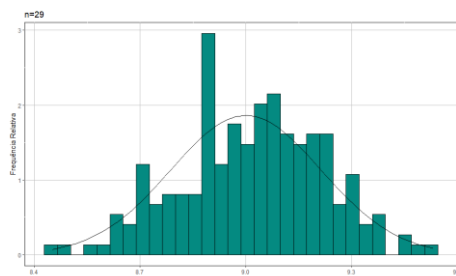
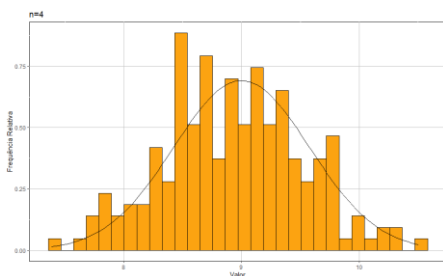
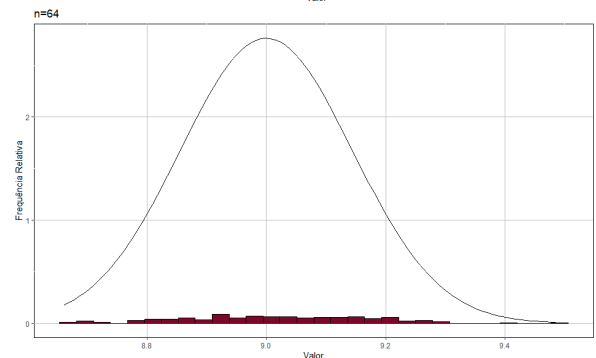
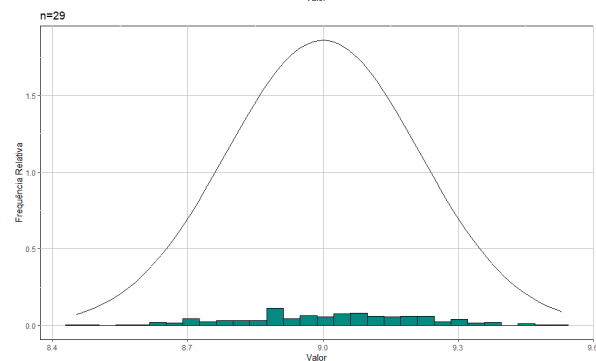
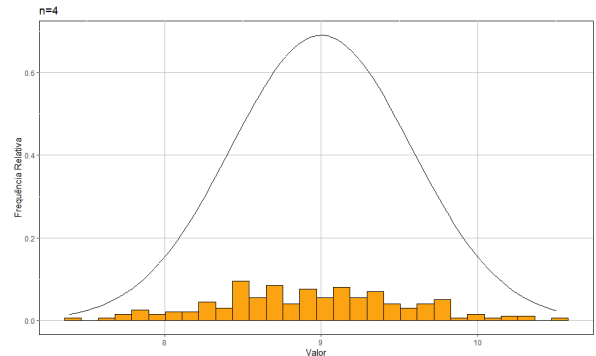
plot

```
plot <- ggplot(n29, aes(x=m29)) +
  geom_histogram(aes(y = after_stat(count / sum(count))),color="black",fill="#048A81")+
  labs(x = "Valor",y = "Frequência Relativa") +
  ggtitle("n=29") +
  stat_function(fun = dnorm, args = list(mean = (7+11)/2, sd = sqrt((11-7)^2/(12*29))))+
  theme(panel.background = element_rect(fill = "white", colour = "black",
    size = 0, linetype = "solid"),
    panel.grid.major = element_line(size = 0.5, linetype = 'solid',
    colour = "grey"),
    panel.grid.minor = element_line(size = 0.25, linetype = 'solid',
    colour = "white"))
```

plot

```
plot <- ggplot(n64, aes(x=m64)) +
  geom_histogram(aes(y = after_stat(count / sum(count))),color="black",fill="#7B0828")+
  labs(x = "Valor",y = "Frequência Relativa") +
  ggtitle("n=64") +
  stat_function(fun = dnorm, args = list(mean = (7+11)/2, sd = sqrt((11-7)^2/(12*64))))+
  theme(panel.background = element_rect(fill = "white", colour = "black",
    size = 0, linetype = "solid"),
    panel.grid.major = element_line(size = 0.5, linetype = 'solid',
    colour = "grey"),
    panel.grid.minor = element_line(size = 0.25, linetype = 'solid',
    colour = "white"))
```

plot



seed = 1823 | size(n) = [4,29,64] | Unif(7,11)

O primeiro conjunto de gráficos (assinalados com A) mostram o pedido, ou seja, o histograma de frequência relativa da média das amostras com a sobreposição da curva normal correspondente. A visualização dos histogramas em si é pouco clara devido à diferença de escalas.

Logo para facilitar a visualização criei um outro conjunto de gráficos (assinalados com B) onde normalizei a escala do histograma e onde se pode ver de forma a clara como a normal calculada encaixa no histograma, isto deve-se ao teorema do limite central, já que com tantas amostras podemos aproximar a distribuição dos resultados a uma normal.