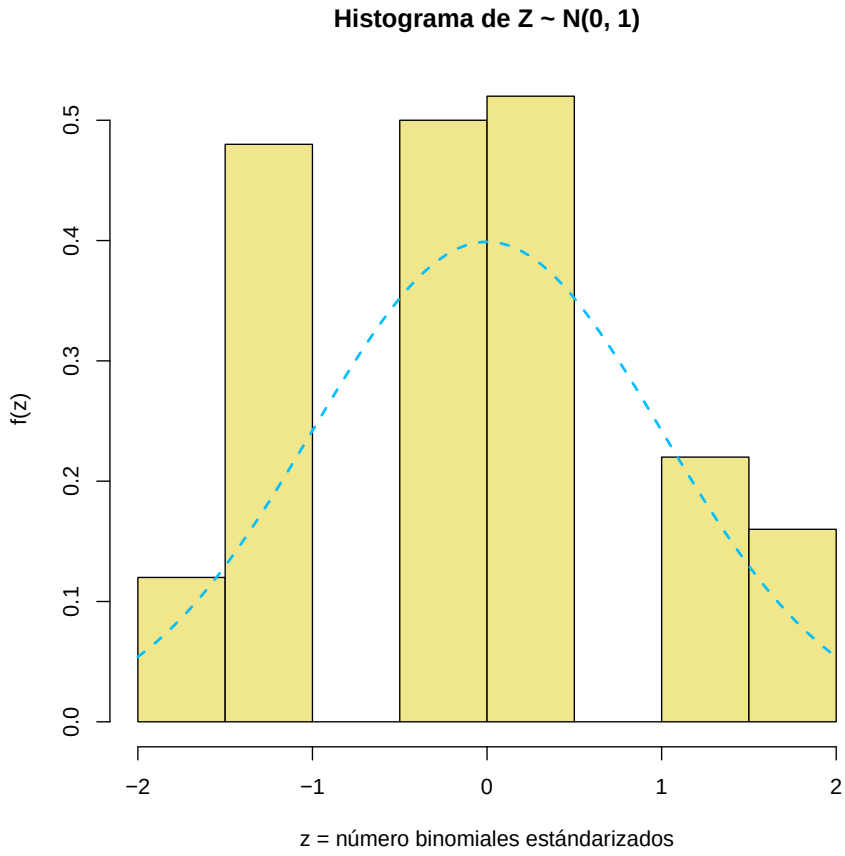
```r
#GUIA 16

# tm= tamao de la muestra
tm=100; n <- 10; p <- 0.25
#generando las 100 nmeros aleatorios
S = rbinom(tm, n, p)
# estandarizando cada una de las observaciones
Z = (S-n*p)/sqrt(n*p*(1-p)); Z
```

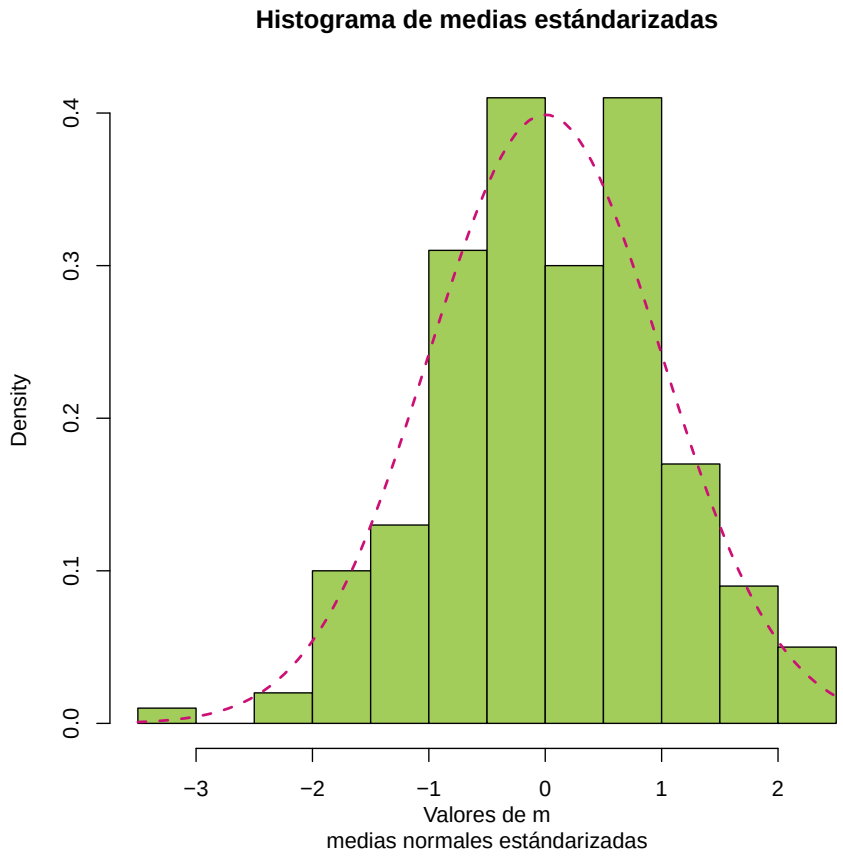
```
##   [1] -1.0954451 -0.3651484  1.8257419 -0.3651484 -0.3651484 -0.3651484
##   [7]  1.8257419 -1.8257419 -1.0954451  1.8257419  0.3651484  1.0954451
##  [13] -0.3651484 -0.3651484 -0.3651484  0.3651484  0.3651484  0.3651484
##  [19] -1.0954451 -1.0954451 -1.8257419  0.3651484  0.3651484 -1.0954451
##  [25] -1.0954451 -0.3651484  0.3651484  1.0954451 -0.3651484  0.3651484
##  [31]  0.3651484  1.8257419 -0.3651484 -0.3651484  0.3651484 -0.3651484
##  [37] -0.3651484  0.3651484  1.0954451  0.3651484 -0.3651484 -1.0954451
##  [43]  0.3651484 -0.3651484  1.0954451 -0.3651484  0.3651484 -1.8257419
##  [49] -1.0954451  1.0954451 -1.0954451  0.3651484  1.8257419 -1.8257419
##  [55]  1.0954451  0.3651484 -1.0954451  0.3651484 -0.3651484 -1.0954451
##  [61] -0.3651484 -1.0954451  1.8257419 -1.8257419  1.0954451 -1.0954451
##  [67] -0.3651484  1.0954451 -0.3651484 -1.0954451 -0.3651484  0.3651484
##  [73]  0.3651484 -1.0954451 -1.0954451  1.0954451 -1.8257419  1.0954451
##  [79]  0.3651484  0.3651484 -1.0954451  0.3651484  1.8257419 -1.0954451
##  [85] -1.0954451  0.3651484 -1.0954451 -1.0954451 -0.3651484  0.3651484
##  [91] -1.0954451 -1.0954451 -1.0954451 -0.3651484  0.3651484  0.3651484
##  [97] -0.3651484  1.0954451  1.8257419 -0.3651484
```

```r
hist(Z, main="Histograma de Z ~ N(0, 1)", xlab="z = nmero binomiales estndarizados",
ylab="f(z)", prob=TRUE, col="khaki")
curve(dnorm(x, 0, 1), col = "deepskyblue", lty=2, lwd=2, add=TRUE)
```

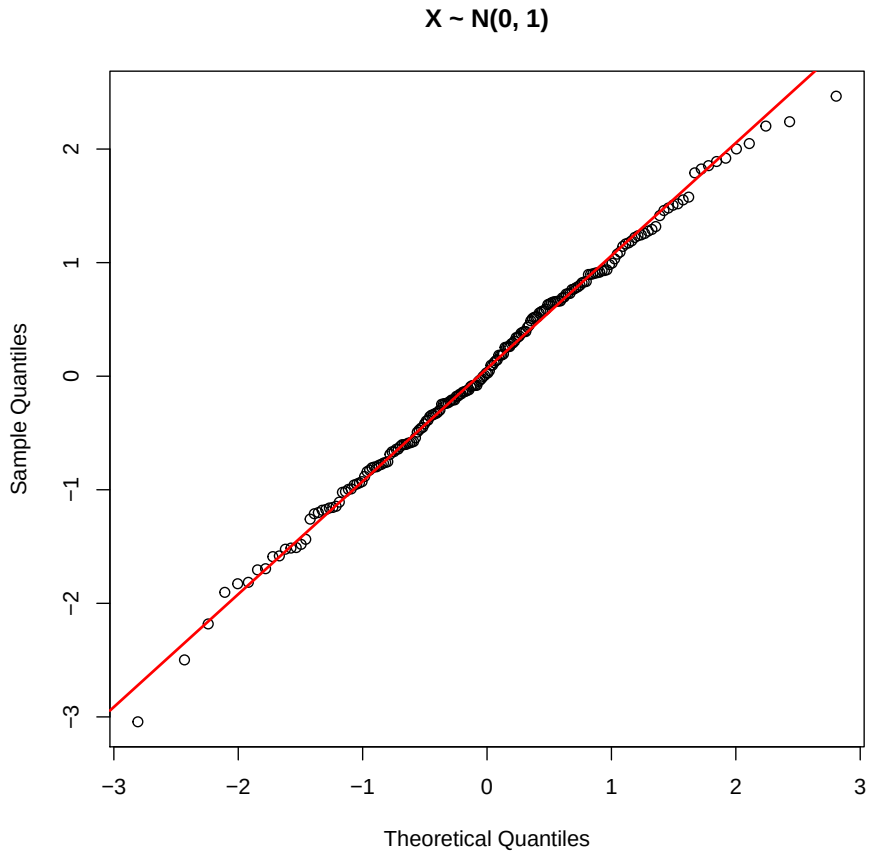



```
simulNorm <- function(mu, sigma, m=5, n=100)
{
vectMedias <<- numeric(0)
MediasEstand <<- numeric(0)
for (i in 1:m)
{
X = rnorm(n, mu, sigma)
# genera n valores normales
vectMedias[i] <<- mean(X)
MediasEstand[i] <<- (vectMedias[i] - mu)/(sigma/sqrt(n))
}
}
mu=5; sigma=5
m <- 200
# nmero de muestras o medias a obtener
simulNorm(mu, sigma, m)
```

```r
hist(MediasEstand, main="Histograma de medias estndarizadas", xlab="Valores de m
medias normales estndarizadas", prob=TRUE, col="darkolivegreen3")
curve(dnorm(x, 0, 1), col = "deeppink3", lty=2, lwd=2, add=TRUE)
```




```r
qqnorm(MediasEstand, main="X ~ N(0, 1)")
#muestra la lnea
qqline(MediasEstand, lty=1, lwd=2, col="red")
```




```
simulExp <- function(mu, m=5, n=100)
{
razon <- 1/mu
vectMedias <<- numeric(0)
MediasEstand <<- numeric(0)
for (i in 1:m)
{
X = rexp(n, razon)
# genera n valores exponenciales
vectMedias[i] <<- mean(X)
MediasEstand[i] <<- (vectMedias[i] - mu)/(mu/sqrt(n))
}
}
par(mfrow=c(2,2))
# para n=1
mu=10
```

```r
m <- 100; n <- 1
simulExp(mu, m, n)
hist(MediasEstand, main="Medias Exp(10); n=1", xlab="m medias exp estndarizadas",
prob=TRUE, col="darkolivegreen3")
xvals = seq(from=-3, to=3, by=0.01)
points(xvals, dnorm(xvals, 0, 1), col = "red", type="l", lty=1, lwd=2)

# para n=5
n <- 5
simulExp(mu, m, n)
hist(MediasEstand, main="Medias Exp(10); n=5", xlab="m medias exp estndarizadas",
prob=TRUE, col="darkolivegreen3")
xvals = seq(from=-3, to=3, by=0.01)
points(xvals, dnorm(xvals, 0, 1), col = "red", type="l", lty=1, lwd=2)
```