# Act1_A01251534

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## Pregunta 1

```
library(mnormt)
x = c(2,3)
miu = c(2.5, 4)
sigma = matrix(c(1.2, 0, 0, 2.3), nrow = 2)
sigma
```

```
##      [,1] [,2]
## [1,]  1.2  0.0
## [2,]  0.0  2.3
```

```
pmnorm(x,miu,sigma)
```

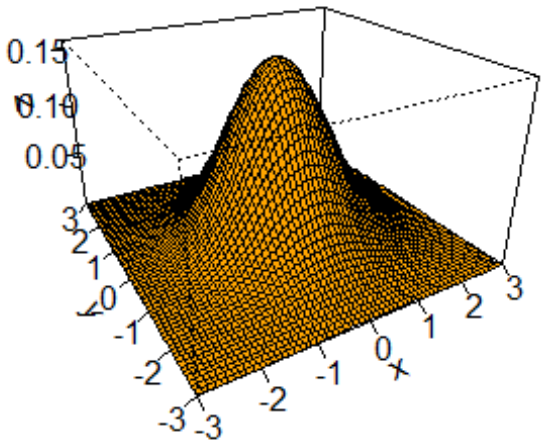
```
## [1] 0.08257333
```

## Pregunta 2

```
library(mnormt)
x     <- seq(-3, 3, 0.1)
y     <- seq(-3, 3, 0.1)
mu    <- c(0, 0)
sigma <- matrix(c(1, 0, 0, 1), nrow=2)
f     <- function(x, y) dmnorm(cbind(x, y), mu, sigma)
z     <- outer(x, y, f)
sigma
```

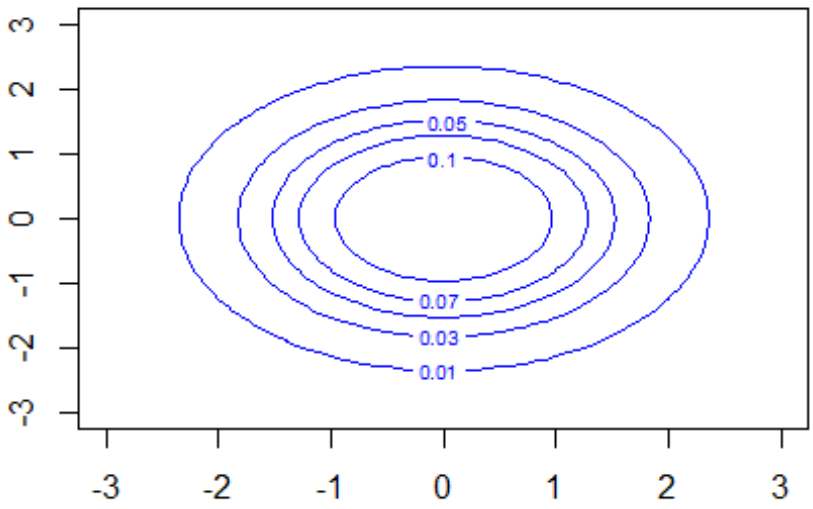
```
##      [,1] [,2]
## [1,]    1    0
## [2,]    0    1
```

```
#create surface plot
persp(x, y, z, theta=-30, phi=25, expand=0.6, ticktype='detailed', col = "ora
nge")
```




## Pregunta 3

```
contour(x, y, z, col = "blue", levels = c(0.01,  0.03, 0.05,0.07,0.1))
```

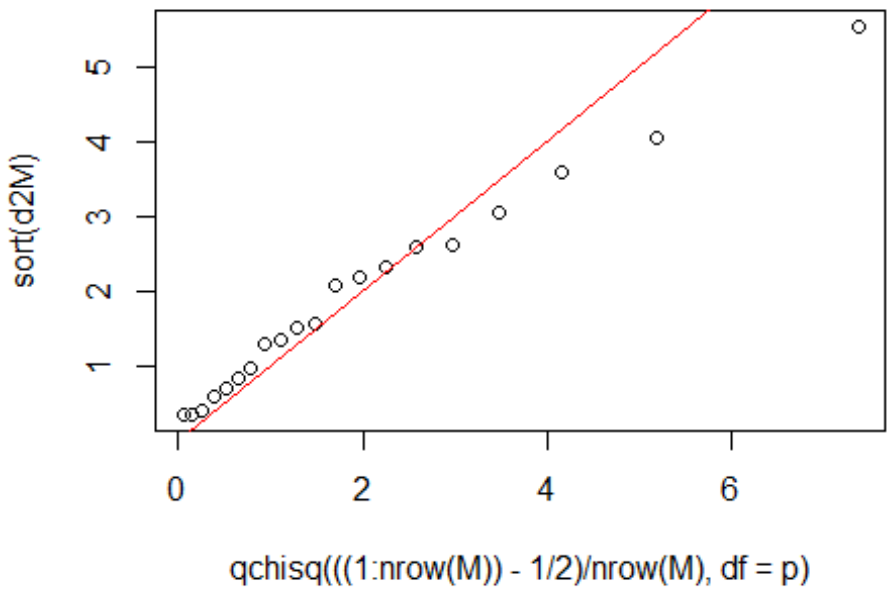



## Pregunta 4

```
M = read.csv("datos.csv")

p = 2        #indica que se trata de dos variables
# Vector de medias
X = colMeans(M)
#Matriz de covarianza
S = cov(M)
#Distancia de Mahalanobis
d2M =  mahalanobis(M,X,S)

#Multinormalidad Test gráfico Q-Q Plot
plot(qchisq(((1:nrow(M)) - 1/2)/nrow(M),df=p),sort( d2M ) )
abline(a=0, b=1,col="red")
```




```
## Test de Multinomalidad: Método Sesgo y kurtosis de Mardia
#mvn(M,subset = NULL,mvn = "mardia", covariance = FALSE,showOutliers = FALSE)
```