#1

x <- matrix(rep(seq(-5,5,length=100),100),100,100,byrow=TRUE)

y <- t(x)

zsq <- (5^2 - x^2 - y^2)\*(5^2 - x^2 - y^2 > 0)

z <- sqrt(zsq)

contour(x[1,],y[,1],z, nlevels=10)

image(z)

#2

x <- runif(100, min=-1, max=1)

y <- runif(100, min=-1, max=1)

z <- 1 + x + 2 \* y + rnorm(100)

lm(z~x+y)

x1 <- matrix(rep(seq(-1, 1, length= 21),21),21,21,byrow=TRUE)

y1 <- t(x1)

z1 <- 1 + x1 + 2 \* y1

surface <- persp(x1[1,], y1[,1], z1, theta = 10, phi = 30, expand = 1,

col =terrain.colors(30))

xy.list = trans3d(x, y, z, surface)

points(xy.list, pch=20, col="black")

