1a)

jul\_a<- pnorm(25,31.5,4.2)

jul\_b<- pnorm(37,31.5,4.2)

pr\_jul<-jul\_b-jul\_a # 0.84396 - probability for the month of July to be within 25 to 37 degrees

jan\_a<- pnorm(25,22.4,3.2)

jan\_b<- pnorm(37,22.4,3.2)

pr\_jan<-jan\_b-jan\_a # 0.2082 - probability for the month of January to be within 25 to 37 degrees

run\_jul<-1-pnorm(25,31.5,4.2) # 0.93 - if greater than 0.2 he will not run

run\_jan<-1-pnorm(25,22.4,3.2) # 0.208 - if greater than 0.2 he will not run

# he will not run on the beach in both months.

2(i)

library(cubature)

f <- function(x)

{

x[1]\*x[1]+x[2]\*x[2]

}

one\_by\_k=(adaptIntegrate(f,c(0,0),c(2,2)))

# k=3/32

2(iii)

library(cubature)

f <- function(x)

{

(3/32)\*(x[1]\*x[1]+x[2]\*x[2])

}

Pr=(adaptIntegrate(f,c(0.4,0.2),c(0.8,0.4))) # 0.0035

3a)

library(plot3D)

y=seq(0,1,0.01)

x=seq(0,2,0.02)

cdf\_y=(3\*y\*y+4\*y)/9

cdf\_x=(3\*x\*x+2\*x)/36

pdf= function(x,y){

(x+y)/3

}

plot(y,cdf\_y,type="l",xlab="y",ylab="cdf of y",main="cdf of y")

plot(x,cdf\_x,type="l",xlab="x",ylab="cdf of x",main="cdf of x")

z=outer(x, y ,pdf)

persp(x,y,z,theta=30,phi=30,ticktype="detailed")

