**Problem 4 R Code and Plot**

> #Problem 4

>

> n<-5000

>

> #Chosen values and Prior Parameters:

> theta0 = 1

> sig0 = 0.5

> v0 = 1

> k0 = 1

> kn<-k0+n

> vn<-v0+n

>

> y<-rnorm(n, mean=0, sd = 1)

> yb<-mean(y)

> SS<-sum((y-yb)^2)

> theta\_n<-(k0\*theta0+n\*yb)/kn

> SSn<-(v0\*sig0+SS+(k0\*n)\*(y-theta0)^2/kn)/vn

> sig <- 1/rgamma(5000,vn/2,vn\*SSn/2)

> theta<-rnorm(5000, theta\_n, sqrt(sig/kn))

> t<-rt(5000, df=vn)\*sqrt(SSn/kn)+theta\_n

> theta\_density<-density(theta)

> t\_dist<-density(t)

> plot(theta\_density)

> lines(t\_dist, col="red")

