

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")
```

