1.

```
> gibbs.n <- function( iter, mu0, tau0, X=X ) {

      mu <- mu0
      tau <- tau0

      mus <-NULL
        sds <-NULL
        tau <-NULL

      xbar <- mean(X)
      n <- length(X)

   for(i in 1: iter ) {

mu <- rnorm(1, xbar, sqrt(tau/n) )
     tau <- sum((X-mu)^2)/rchisq(1,n)
     std <- sqrt(tau)

mus <- append(mus,mu)
     vars<- append(taus, tau)
     sds <- append(sds, std)

     }

   list(mu=mus, tau=taus, sd=sds)

}

> X <- rnorm(15,3,5) # normal sample with mean3, var 25

> eg <- gibbs.n(10000,0,1, X)
> hist(as.vector(eg$mu), prob=T, nclass=50)
```

2. sample from N(0,1) using M-H

```
> mh.norm <-function(iter, a, x) {
  xs <-NULL
  accepts <-0
for(i in 1:iter){
    xprop <- x+runif(1,-a,a) # Proposal moves a random distance +/-
    alpha <- (-xprop^2+x^2)/2 # Prop to log(p(xstar)/p(x))
    u <- log(runif(1,0,1)) # Logs is good !!!
  if(u < alpha){
    x <- xprop #accept proposal
  accepts <- accepts+1 # count the acceptance
       }
  xs <- append(xs,x)
  }
    ac <- accepts/iter
    list(xs=xs, ac=ac)
}
> n.mh <- mh.norm(10000,5,0)
> hist(n.mh$xs,prob=T,50)
> n.mh$ac
```