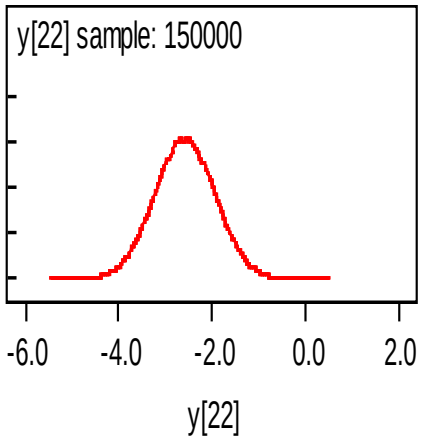
## Problem 8.2:




| | mean | sd | MC_error | val2.5pc | median | val97.5pc | start | sample |
|---|---|---|---|---|---|---|---|---|
| y[22] | -2.589 | 0.6481 | 0.001669 | -3.858 | -2.59 | -1.322 | 1001 | 150000 |

Comparing to the result of 6.2.8.3, the mean is quite similar. We obtained -2.589 here and -2.586 in 6.2.8.3. Standard deviation here is 0.6481 while the sd is 1/60 =0.01667 is 6.2.8.3. The difference indicates that the **Openbugs output is more spread out**. In other words, the distribution is 6.2.8.3 is more concentrated around the center of -2.586.

## Problem 8.4:

**1.** Since the conjugate family of the prior is IG(38,444), the conjugate family prior for normal precision is **Gamma(38,444).** Presidion = 1/variance.

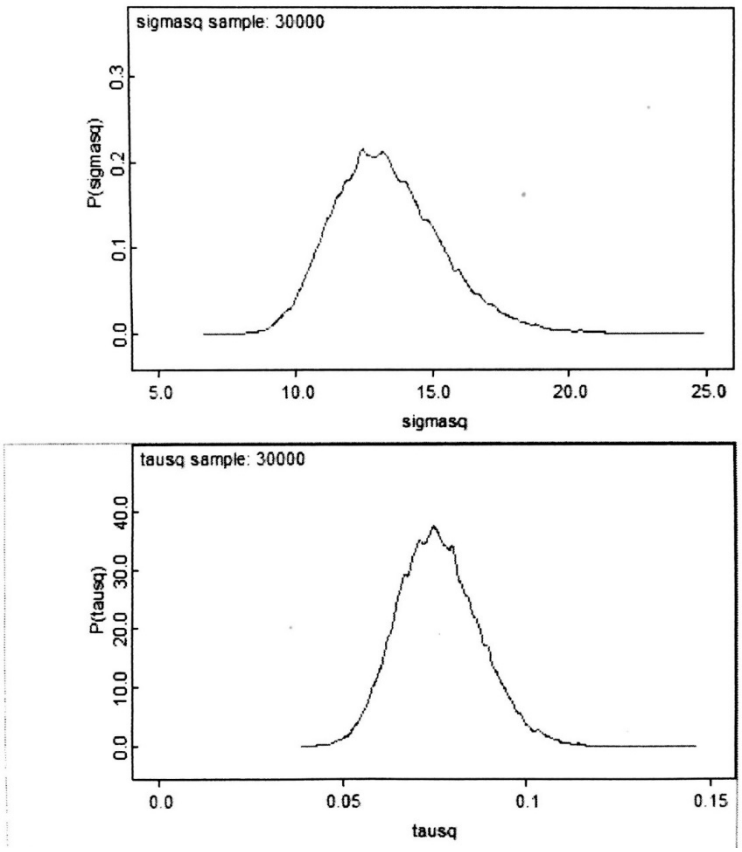
**2.**

```
model
{

# likelihood
for (i in 1:N) {
y[i] ~ dnorm( mu, tausq )
}
# priors
tausq ~ dgamma( 38, 444)
sigmasq <- 1/tausq
}

#data
list(y=c(46, 58, 40, 47, 47, 53, 43, 48, 50, 55, 49, 50, 52, 56, 49,
54, 51, 50, 52, 50), N=20, mu=51)

#inits for model 1
list(mu = 5)
list(mu = 10)
list(mu = 15)
```




The stat output is:

| | mean | sd | MC_error | val2.5pc | median | val97.5pc | start | sample |
|---|---|---|---|---|---|---|---|---|
| sigmasq | 13.37 | 1.975 | 0.01074 | 10.04 | 13.19 | 17.73 | 1 | 30000 |
| tausq | 0.07641 | 0.01109 | 6.012E-5 | 0.05639 | 0.07582 | 0.09961 | 1 | 30000 |

Sigmasq mean in 6.2 is 13.362, which is very close to that of Openbugs but **slightly smaller** than what Openbugs generates. It makes sense because Openbugs drew a large sample size to make the result more preciously. For variance, the estimated posterior variance is $1.975^2 = 3.901$, which is **consistent with** the previous result.