

## Error in HW #1, problem (2)

② Assume  $R = \sigma_\varepsilon^2 I_n$ , and assume  $\sigma_\varepsilon^2$  has an inverse gamma prior distribution. Re-parameterize from  $(\sigma_\varepsilon^2, G)$  to  $(\sigma_\varepsilon^2, G^*)$  for  $G^* = \frac{1}{\sigma_\varepsilon^2} G$ .

Starting from ①, derive the marginal posterior distribution of  $G^*$ .

This is not enough information to solve the problem as I intended.

Needed:  $\sigma_\varepsilon^2$  and  $G^*$  are independent a priori

Why?  $\pi(\sigma_\varepsilon^2, G | y) \propto \pi(\sigma_\varepsilon^2, G) \text{ Likelihood}(\sigma_\varepsilon^2, G)$

$$\Rightarrow \pi(\sigma_\varepsilon^2, G^* | y) \propto \underbrace{\pi(\sigma_\varepsilon^2, \frac{G}{\sigma_\varepsilon^2}) |J|}_{= \pi(\sigma_\varepsilon^2, G^*)} \text{ Likelihood}(\sigma_\varepsilon^2, G^*)$$

→ If this doesn't separate cleanly, the integral is intractable.

2/4/08