

1.

$$P(\theta, \alpha, \beta | y) \propto P(\alpha, \beta) \prod_{j=1}^n \frac{\Gamma(\alpha+\beta)}{\Gamma(\alpha)\Gamma(\beta)} \theta_j^{\alpha-1} (1-\theta_j)^{\beta-1} \prod_{j=1}^n \binom{n_j}{y_j} \theta_j^{y_j} (1-\theta_j)^{n_j-y_j}$$

$$P(\alpha, \beta | y) \propto (\alpha+\beta)^{-\frac{5}{2}} \frac{\Gamma(\alpha+\beta)}{\Gamma(\alpha)\Gamma(\beta)} \int_0^1 \theta_j^{\alpha+y_j-1} (1-\theta_j)^{\beta+n_j-y_j-1} d\theta$$

$$= (\alpha+\beta)^{-\frac{5}{2}} \frac{\Gamma(\alpha+\beta)}{\Gamma(\alpha)\Gamma(\beta)} \cdot \frac{\Gamma(\alpha+y_j) \Gamma(\beta+n_j-y_j)}{\Gamma(\alpha+\beta+n_j)}$$

→ line 44.

2.

