



$$\begin{aligned}\pi(x_1, x_2 \mid \tilde{x}_3, \tilde{x}_4) \\ &\propto \pi(x_1, x_2, \tilde{x}_3, \tilde{x}_4) \\ &\propto \pi(\tilde{x}_4 \mid x_2) \cdot \pi(\tilde{x}_3 \mid x_2) \cdot \pi(x_2 \mid x_1) \cdot \pi(x_1)\end{aligned}$$