

**Problem 1**

(a)

$$\begin{aligned} f(\pi|x) &= \prod_{i=1}^n \binom{k}{x_i} \pi^{x_i} (1-\pi)^{k-x_i} \\ &= \left( \prod_{i=1}^n \binom{k}{x_i} \right) \pi^{\sum_{i=1}^n x_i} (1-\pi)^{\sum_{i=1}^n k-x_i} \end{aligned}$$

(b)

(c)

(d)

(e)

(f)

**Problem 2**

(a)

(b)

(c)

(d)