$$\pi(\theta=1|x_1\ldots x_n)=\frac{P(\theta=1)\cdot f(x_1\ldots x_n|\theta=1)}{P(\theta=1)\cdot f(x_1\ldots x_n|\theta=1)+P(\theta=2)\cdot f(x_1\ldots x_n|\theta=2)}=$$

$$=\frac{1/2\prod_{i=1}^{n} f(x_i|\theta=1)}{1/2\prod_{i=1}^{n} f(x_i|\theta=1)+1/2\prod_{i=1}^{n} f(x_i|\theta=2)}=\frac{\prod_{i=1}^{n} 1\cdot x_i^0}{\prod_{i=1}^{n} 1\cdot x_i^0+\prod_{i=1}^{n} 2\cdot x_i}=$$

$$=\frac{1}{1+2^n\prod_{i=1}^{n} x_i}.$$

Análogamente

$$\pi(\theta=2|x_1\ldots x_n)=\frac{2^n\prod_{i=1}^{n} x_i}{1+2^n\prod_{i=1}^{n} x_i}$$

La región de rechazo es

$$R=\{(x_1\ldots x_n)\,|\,\pi(\theta=1|x_1\ldots x_n)<\pi(\theta=2|x_1\ldots x_n)\}$$

La condición $\pi(\theta=1|x_1\ldots x_n)<\pi(\theta=2|x_1\ldots x_n)$ equivale a

$$\frac{1}{1+2^n\prod_{i=1}^{n} x_i}<\frac{2^n\prod_{i=1}^{n} x_i}{1+2^n\prod_{i=1}^{n} x_i}\iff 1<2^n\prod_{i=1}^{n} x_i\iff$$

$$\iff\frac{1}{2^n}<\prod_{i=1}^{n} x_i$$

Esto es $\boxed{R=\{(x_1\ldots x_n)\,|\,\frac{1}{2^n}<\prod_{i=1}^{n} x_i\}}$