№1

$$P_\lambda(n) = \frac{\lambda^n}{n!} e^{-\lambda}$$

1.) $$P(\lambda|m) = \frac{P(m|\lambda)\cdot P(\lambda)}{P(m)} = \frac{P(m|\lambda)\cdot P(\lambda)}{\int P(m|\lambda)\,P(\lambda)\,d\lambda} = \frac{P_\lambda(m)\cdot P(\lambda)}{\int P_\lambda(m)\,P(\lambda)\,d\lambda}$$

Считая $P(\lambda) = const$:

$(-a < \lambda < a)$

$$P(\lambda|m) = \frac{P_\lambda(m)}{\int P_\lambda(m)\,d\lambda}$$

2.) $$P(\lambda|m,m') = \frac{P(m'|m,\lambda)\cdot P(\lambda|m)}{P(m')} = \frac{P_\lambda(m')\,P(\lambda|m)}{\int P(m'|\lambda)\,P(\lambda|m)\,d\lambda} =$$

$$= \frac{P_\lambda(m')\,P(\lambda|m)}{\int P_\lambda(m')\,P(\lambda|m)\,d\lambda}$$

№2

$$p_0(x) = \frac{1}{Z} e^{-\frac{x^T A x}{2}}$$

$$P(A|x_1) = \frac{P(x_1|A)\cdot P(A)}{P(x_1)} = \frac{P(x_1|A)\cdot P(A)}{\int P(x_1|A)\,P(A)\,dA}$$

по предположению $P(A) = const$

$$p_1(x) = p(A)\int \frac{1}{Z} e^{-\frac{x^T A x}{2}}\,dA$$

$$p_2(x) = \int \frac{1}{Z} e^{-\frac{x^T A x}{2}} \frac{P(x_1|A)\cdot P(A)}{\int p(x_1|A)\,p(A)\,dA}\,dA = \int \frac{\frac{1}{Z} e^{-\frac{x^T A x}{2}} \cdot \frac{1}{Z} e^{-\frac{x_1^T A x}{2}}}{\int \frac{1}{Z} e^{-\frac{x_1^T A x}{2}}\,dA}\,dA$$