1.21 $\int_{R_1} P(x, C_2)\, dx \leq \int_{R_1} \sqrt{P(x, C_2) P(x, C_1)}\, dx$

$\int_{R_2} P(x, C_1)\, dx \leq \int_{R_2} \sqrt{P(x, C_1) P(x, C_2)}\, dx$

$P(\text{mistake}) \leq \int_{R_1} \sqrt{P(x, C_2) P(x, C_1)}\, dx + \int_{R_2} \sqrt{P(x, C_1) P(x, C_2)}\, dx$

$= \int_{R_1 \cup R_2} \sqrt{P(x, C_2) P(x, C_1)}\, dx$

$= \int \sqrt{P(x, C_2) P(x, C_1)}\, dx$