Behauptung: $U_1 \leq G_1,\ U_2 \leq G_2 \quad \to \quad U_1 \times U_2 \leq G_1 \times G_2$

Beweis: $U_1 \times U_2 \neq \emptyset$, denn $(e_1, e_2) \in U_1 \times U_2$

$a, b \in U_1 \times U_2, \quad a = (a_1, a_2), \quad b = (b_1, b_2)$

$$\begin{aligned} ab^{-1} &= (a_1, a_2) \cdot (b_1, b_2)^{-1} \\ &= (a_1, a_2) \cdot (b_1^{-1}, b_2^{-1}) \\ &= (\underbrace{a_1 b_1^{-1}}_{\in U_1}, \underbrace{a_2 b_2^{-1}}_{\in U_2}) \\ &\in U_1 \times U_2 \qquad \text{(da } U_1 \leq G_1, \ U_2 \leq G_2\text{)} \end{aligned}$$