

Aufgabe 2

e) **Kartesisches Produkt:** $\{a, b\} \times \{1, 2\} = \{(a, 1), (a, 2), (b, 1), (b, 2)\}$

Potenzmenge: $\mathcal{P}(\{a, b\} \times \{1, 2\})$ enthält $2^4 = 16$ Elemente!

$$\begin{aligned} \mathcal{P}(\{a, b\} \times \{1, 2\}) = & \{\emptyset, \\ & \{(a, 1)\}, \{(a, 2)\}, \{(b, 1)\}, \{(b, 2)\}, \\ & \{(a, 1), (a, 2)\}, \{(a, 1), (b, 1)\}, \{(a, 1), (b, 2)\}, \{(a, 2), (b, 1)\}, \\ & \{(a, 2), (b, 2)\}, \{(b, 1), (b, 2)\}, \\ & \{(a, 1), (a, 2), (b, 1)\}, \{(a, 1), (a, 2), (b, 2)\}, \{(a, 2), (b, 1), (b, 2)\}, \\ & \{(a, 1), (b, 1), (b, 2)\} \\ & \{(a, 1), (a, 2), (b, 1), (b, 2)\} \\ & \} \end{aligned}$$

Kontrolle: $|\mathcal{P}(\{a, b\} \times \{1, 2\})| = 2^4 = 16$