QUIZ 5 FOR M325K

Name:	SOLUTION
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(1) Let $A = \{\alpha, \beta\}$ and $B = \{a, b\}$. Find $A \times B$.

$\{(\alpha, a), (\alpha, b), (\beta, a), (\beta, b)\}$

(2) Define the power set of A, $\mathscr{P}(A)$.

The power set of A is the set of all subsets of A.

(3) Let $A = \{1, 2, 3\}$. Find $\mathscr{P}(A)$.

$\{\emptyset, \{1\}, \{2\}, \{3\}, \{1,2\}, \{1,3\}, \{2,3\}, \{1,2,3\}\}$

(4) Define what it means for a collections of sets $A_1, \ldots, A_n$ to form a *partition* of a set B.

A collection of sets $A_1, \ldots, A_n$ is a partition of B if

i) $A_1 \cup \cdots \cup A_n = \bigcup_{i=1}^{n} A_i = B$.

ii) $A_1, \ldots, A_n$ are mutually disjoint ($A_i \cap A_j = \emptyset$ for $i \neq j$).

(5) Let $A = \{1, 2, 3\}$. Find all partitions of A that don't involve the empty set.

$\{\{\{1\},\{2\},\{3\}\}, \{\{1\},\{2,3\}\}, \{\{2\},\{1,3\}\}, \{\{3\},\{1,2\}\}, \{\{1,2,3\}\}\}$