

MATH 213 – DISCRETE MATH – Fall 2024 – Quiz 1 – Wednesday, Sept. 4
This quiz contains 3 questions – You have 15 minutes

Name: _____

Problem 1. Let $A = \{1, 3, 6\}$.

a. Find $A \times A$ and $|A \times A|$.

Solution: $A \times A = \{(1, 1), (1, 3), (1, 6), (3, 1), (3, 3), (3, 6), (6, 1), (6, 3), (6, 6)\}$

$|A \times A| = 9$

b. Find $\mathcal{P}(A)$ and $|\mathcal{P}(A)|$.

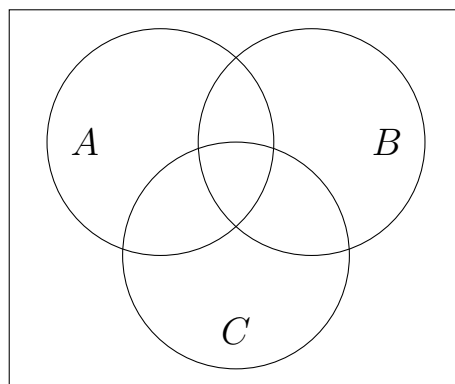
Solution: $\mathcal{P}(A) = \{\emptyset, \{1\}, \{3\}, \{6\}, \{1, 3\}, \{1, 6\}, \{3, 6\}, \{1, 3, 6\}\}$

$|\mathcal{P}(A)| = 8$

Problem 2. Let A , B , and C be sets. Shade the Venn diagram below to represent the set

$$(A - B) \cup (B - C) \cup (C - A).$$

(Be very clear about which region(s) are shaded and which aren't)



Solution: Every region should be shaded except the center one.

Problem 3. True or False? (no work needed)

a. $\mathbb{N} \subsetneq \mathbb{Z}$.

Solution: True

b. $\emptyset \subseteq \emptyset$.

Solution: True

c. For any two sets A and B (and a fixed universal set U), if $A \subseteq B$, then $\overline{B} \subseteq \overline{A}$.

Solution: True

d. For any two finite sets A and B , $|A \cap B| \leq |A|$.

Solution: True