

MATH 213 – DISCRETE MATH – Spring 2026 – Quiz 1 – Wednesday, Jan. 28
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. Fill out the truth table below for the statement $(p \wedge q) \vee (\neg r)$.

p	q	r	$p \wedge q$	$\neg r$	$(p \wedge q) \vee (\neg r)$
T	T	T			
T	T	F			
T	F	T			
T	F	F			
F	T	T			
F	T	F			
F	F	T			
F	F	F			

Solution:

p	q	r	$p \wedge q$	$\neg r$	$(p \wedge q) \vee (\neg r)$
T	T	T	T	F	T
T	T	F	T	T	T
T	F	T	F	F	F
T	F	F	F	T	T
F	T	T	F	F	F
F	T	F	F	T	T
F	F	T	F	F	F
F	F	F	F	T	T

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

a. $\forall x \in \mathbb{N}, x^2 \in \mathbb{N}.$

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