

Key

Quiz I Math 3322
DeMaio Fall 2008

1. (10 points) List the members of the set $S = \{x | \sqrt{x} \in \mathbb{Z} \text{ and } |x| \leq 20\}$.

$$S = \{0, 1, 4, 9, 16\}$$

2. (10 points) Use set builder notation to compute $\mathbb{Z}^+ - \{x | x \in \mathbb{Z} \text{ and } x \text{ is even}\}$.

$$\{x | x \text{ is a positive odd integer}\}$$

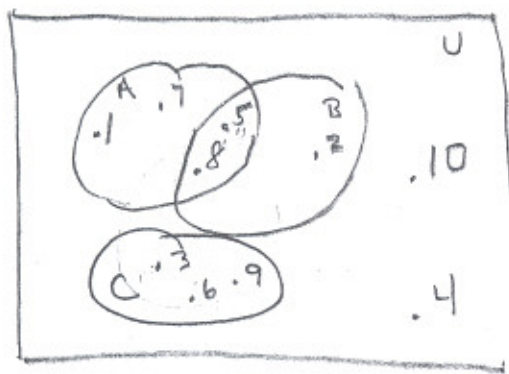
3. (10 points) Find $P(A)$ for $A = \{1, a, *\}$.

$$P(A) = \{ \emptyset, \{1\}, \{a\}, \{*\}, \{1, a\}, \{1, *\}, \{a, *\}, \{1, a, *\} \}$$

4. (10 points) Find $|P(A)|$ for $A = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$.

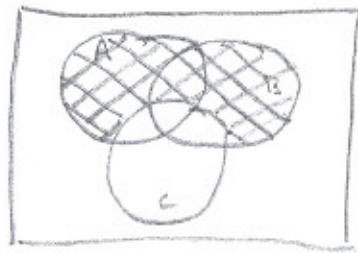
$$|P(A)| = 2^{|A|} = 2^{10} = 1024$$

5. (10 points) For $U = \{1, 2, 3, \dots, 9, 10\}$, draw the sets $A = \{1, 5, 7, 8\}$, $B = \{2, 5, 8\}$ and $C = \{3, 6, 9\}$ in a Venn diagram.

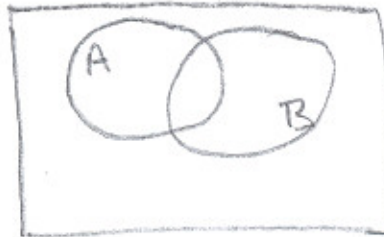


6. (10 points each) In a Venn diagram shade

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



ii) $(A \cap B) - B = \emptyset$



7. (8 points each) Let $A = \{1, 2, 3, 4\}$ and $B = \{2, 5, 7\}$. Construct by listing the members and find the cardinality of each of the following sets.

i) $A \cup B = \{1, 2, 3, 4, 5, 7\}$ $|A \cup B| = 6$

ii) $A \cap B = \{2\}$ $|A \cap B| = 1$

iii) $A - B = \{1, 3, 4\}$ $|A - B| = 3$

iv) $B - A = \{5, 7\}$ $|B - A| = 2$

v) $A \times B = \{(1, 2), (1, 5), (1, 7), (2, 2), (2, 5), (2, 7), (3, 2), (3, 5), (3, 7), (4, 2), (4, 5), (4, 7)\}$

$|A \times B| = 12$