

Quiz #5 11/13/09

Name: _____

Directions: Make sure to read each problem carefully. To receive full credit, you must show all of your work.

Problem 1. (2 points) If there are 62 nonempty, proper subsets of A , then A has _____ elements.

Problem 2. (2 points) If A has cardinality 12, how many subsets have cardinality 5 or 3?

Problem 3. (2 points) Is the following set empty or nonempty? _____

$$\{x | x \in \mathbb{R}, x^2 + 3x + 3 = 0\}$$

Problem 4. (5 points) Suppose that $A \subseteq B$ and $C \subseteq D$. Prove that $A \cup C \subseteq B \cup D$. (Use of a Venn diagram doesn't constitute a proof here.)

Problem 5. (5 points) Given the information in the picture, and the fact that $|A \cap B| = 4$, $|A \cap C| = 5$, and $|B \cap C| = 5$, find

$$|A \cup B \cup C|$$

