Problem Set 1

NAME

DATE

1. Identification

   (a) Identify the following greek letters by name. Include the meaning and common usage if you are able.

      i. δ

      ii. β

      iii. α

      iv. θ

      v. λ

      vi. μ

      vii. Δ

   (b) Identify the following mathematical symbols by name. Include the meaning/usage.

      i. $\in$

      ii. $\cup$

      iii. $\subset$

      iv. $\wedge$

2. Necessary and Sufficient

   (a) Provide an example of a necessary condition

   (b) What is the difference between necessary and sufficient?

3. Set theory

   (a) In roster notation, write the set characterized in set-builder notation as $S = \{x \in \mathbb{Z}, 2 < x < 5\}$.

   (b) Is the following statement True or False? $\forall x \in S, x \geq 2$ for $S = \{3, 2, 5, 9\}$.

   (c) Is the following statement True or False? $\exists x \in S$ s.t. $x \notin \mathbb{Z}$ for $S = \{3, 2, 5, 9\}$.

   (d) Is $\{1, 2, 3, 4\}$ a subset of $\{4, 3, 1, 2\}$? Is it a proper subset?

   (e) Using logical symbols (including $\exists$ and $\forall$) write the definition of a proper subset.

(f) If $A = \{soup, 8\}$ and $B = \{x, soup\}$ find $A \cup B$.

(g) (Follow-up): Now find $A \cap B$.

(h) (Follow-up): Find the Cartesian Product $A \times B$.

4. Topics and Questions

(a) List three things you struggled with on today's assignment.

(b) What is your plan for improving the items listed above?

(c) What percent of the material was new to you today?

(d) What is one new concept you learned today?

(e) What question do you still have about the material?