Name:_____

NetID:_____ **Lecture: A**

Discussion: Monday & Wednesday 1:30 2:30

$A = \{(x, y) \in \mathbb{Z}^2 \mid y = x^2 + 5x + 9\}$

$B = \{(a, b) \in \mathbb{Z}^2 \mid a \leq 2\}$

$C = \{(p, q) \in \mathbb{Z}^2 \mid q > 20\}$

Prove that $A \subseteq B \cup C$.

CS 173, Summer 19 Examlet 3

Name:_____

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Discussion: Monday & Wednesday 1:30 2:30

1. (4 points) $A = \{\text{apple}, \text{maple}, \text{elm}, \emptyset\}$ $B = \{\text{tree}, \text{oak}, \emptyset\}$

   $A \cap B =$

   $\{(p, q) \ : \ p \in \mathbb{Z}, \ q \in \mathbb{Z}, \ \text{and } pq = 6\} =$

2. (4 points) Check the (single) box that best characterizes each item.

   $A \cap B \subseteq A$ ☐ true for all sets A and B ☐ true for some sets A and B ☐ false for all sets A and B

   $\forall x \in \mathbb{N}$, if $x^2 < -3$, then $x > 1000$. ☐ true ☐ false ☐ undefined

3. (7 points) In $\mathbb{Z}_{13}$, find the value of $[7]^{18} + [7]^4$. You must show your work, keeping all numbers in your calculations small. **You may not use a calculator.** You must express your final answer as $[n]$, where $0 \leq n \leq 12$.