# CS 173, Fall 18 Examlet 3, Part B

**Name:**_____

**NetID:**_____ **Lecture: B**

**Discussion: Thursday Friday 11 12 1 2 3 4**

1. (4 points) $A = \{\text{fox}, \text{cat}\}$ $B = \{3, 4\}$ $C = \{3, 7\}$

   $A \times (B \cap C) =$

   $A \cap B =$

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

   $A \cap (B \cup C)$ $= (A \cap B) \cup (A \cap C)$ true for all sets A,B,C ☐ true for some sets A,B,C ☐ false for all sets A,B,C ☐

   $\forall x \in \mathbb{N}$, if $x < -10$, then $x = \pi$. ($\pi$ is the familiar constant.) true ☐ false ☐ undefined ☐

3. (7 points) In $\mathbb{Z}_{11}$, find the value of $[7]^{12} + [9]^5$. 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 $0 \leq n \leq 10$.

# CS 173, Fall 18 Examlet 3, Part B

**Name:**_____

**NetID:**_____ **Lecture: B**

**Discussion: Thursday Friday 11 12 1 2 3 4**

1. (4 points) Is this claim true? Give a concrete counter-example or briefly explain why it's true.

   For any sets $A$, $B$, and $C$, if $A \times C \subseteq B \times C$, then $A \subseteq B$.

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

   $\emptyset$ is ☐ an element of $\mathbb{Z}$ ☐ a subset of $\mathbb{Z}$ ☐ both ☐ neither

   $|A \cup B| = |A| + |B|$ ☐ true for all sets A and B ☐ true for some sets A and B ☐ false for all sets A and B

3. (7 points) In $\mathbb{Z}_{11}$, find the value of $[7]^{38}$. 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 $0 \leq n \leq 10$.