Discrete. Spring 20 Quiz 10. Name _____ Time_____
Show all work for full or partial credit.

1. Given universe $\mathcal{U} = \{1, 2, 3, \ldots, 100\}$; $A = \{7, 9, 10\}$; and $B = \{5, 4, 7, 10\}$. Find the following:
   - $|A \cup B|$
   - $|\overline{A \cup B}|$

2. How many PIN's are there with 8 digits, no repeated digits?

3. How many PIN's are there with 7 digits, no repeated digits, and such that they obey the rule that: either the first digit is 5 or the second digit is 9 (or both)?

4. How many PIN's are there with 5 digits, no repeated digits, and such that the first digit is not 0 and the fourth digit is not 9? (It would be illegal to have repeated digits. It would also be illegal to have a 0 first, illegal to have a 9 fourth, and illegal to have both of those.)