Combinatorics Quiz 1a, Fall '20 Name _____ Time_____
Show all work for full or partial credit.

1.

Given $A = \{7, 9, 10\}$; and $B = \{5, 4, 7, 10\}$. Find the following, where $\mathcal{P}$ indicates the power set:

- $|\mathcal{P}(B - A)|$

- $|\mathcal{P}(B) \times \mathcal{P}(A)|$

2. How many ways are there to order a 2-scoop ice cream cone? There are 3 flavors (chocolate, vanilla, and rum-raisin), but you must choose twice (for the two scoops, which can both be the same flavor, and order of the scoops does matter.) There are two kinds of cones, waffle and regular. You can order sprinkles or no sprinkles.

3. How many ways are there to order a 2-scoop ice cream cone? Again there are 3 flavors, and the order of scoops matters. This time though you may not choose chocolate for both scoops! If you choose chocolate for one, the other must be vanilla or rum-raisin. There are two kinds of cones, waffle and regular. You can order sprinkles or no sprinkles.

4. How many pin numbers are there possible if you must choose 4 digits in a row, but cannot start with a 0, but can use any other digits you want?