_____ will probably do well on this quiz

Where applicable, express your answers in permutation, combination, and/or factorial notation. No need to evaluate to a number.

1. Mr. Hahn wants to proudly display his video game collection on the shelf above his computer. He owns 3 shooter games, 5 strategy games, and 2 catch-monsters-and-have-them-fight-other-monsters games. How many ways can he line them up if...[2 each]

   a. There are no restrictions?

   b. He only has room on the shelf for 5 games?

   c. He has room for all 10, but wants to keep the games of the same genre together?

2. ATM codes consists of 4 digits (0 – 9 are possible. It MAY start with 0, and repetition is allowed). [1 each]

   a. How many different ATM codes are possible? _____

   b. How many different ATM codes without using a "6"? _____

   c. How many ATM codes contain at least 1 "6"? _____

   d. How many ATM codes contain exactly 2 6's? _____

3. Coach K wants to split his 10 basketball players into two teams of 5. Intuitively he thinks that there are "10 Choose 5" ways of doing this. Unfortunately he is wrong.

   a. Explain the error in his thinking. [1]

   b. How many ways can Coach K split his 10 players into two teams of 5? [1]

4. Mrs. Tantod is coaching a baseball team with 15 players on the roster. [2 each]

   a. How many ways can she pick the 9 players to start the game (without determining positions)?

   b. Once the starters have been selected, how many ways can she put the 9 starters into a batting order?

   c. After the game, all 15 players form a circle around Mrs. Tantod to hear her inspiring post-game speech. How many ways are there for the players to stand in a circle such that Leia and her twin Luke are **NOT** next to each other?

5. Out of a standard deck of 52 cards, you draw a random hand of 6 cards. What is the probability that you get...[2 each]

   a. 4 Jacks?

   b. 3 of one value, and 3 of another?

   c. 2 of one value, and 4 of another?

6. If you randomly select a 5-digit number (In 5-digit numbers, the 1st digit cannot be 0), what is the probability that your number will contain only odd digits?[2]

7. Given the letters of the word PREMONITION (11 letters in the word, with 2 O's, 2 N's, and 2 I's)... [2 each]

   a. How many ways can I rearrange the letters to create a distinct sequence of letters?

   b. How many of the ways from (a) have the letters PRE together (but not necessarily in order)?