Perms and Combs Practice QUIZ II

Name:_____

Please circle your final answers

1. In a particular jurisdiction, license plates consist of any three letters, the first of which cannot be I or O, followed by any three non-repeating digits. Determine the number of possible license plates.

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2. Consider the letters in the word "REGRETTABLE". Determine the number of possible arrangements if:

(a) There are no restrictions

(b) Each arrangement must start with an B

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(c) Each arrangement must start with an E

(d) Each arrangement must start and end with a T

3. In a particular family of 8 children, there are 5 boys and 3 girls. A photographer is hired to take a series of family pictures of the children only, where they're arranged in a row. How many ways can this be done if:

a) There are no restrictions

b) If the boys must be on the left side, and the girls on the right side, girls on the right:

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B B B B B G G G

c) If the girls must all be together

d) If two of the girls, Elizabeth and Katie, **cannot** be together

e) If the photograph consists of just three children – 2 boys and 1 girl. (The photographer selects the three, then arranges them in a row)

4. NR The three ➔ problems that can be solved using $\binom{n}{r}$ are ____, _____, .and ____

1	The number of different arrangements using all the letters in the word MATHY
2	The number of unique 5 player teams that can be selected from 8 boys and 9 girls
3	The number of line segments that can be drawn using the vertices of an 8-sided polygon that are marked on a circle.
4	The number of different way to choose 4 specialty donuts from a display of 6 different donuts at a coffee shop
5	The number of different ways to assign the job of chairperson, vice-chair, and secretary for a committee from 6 people.

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5. Algebraically determine the va

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6. Consider the letters in the word SMILE and FROG. The consonants are S, M, L, F, R, and G.
   (a) How many ways can any 2 letters be selected from the word SMILE? *(That is, how many two-letter groups, not arrangements, are possible?)*

   (b) How many ways can any 2 letters be selected from the word SMILE and any 2 letters be selected from the word FROG?

   (c) How many ways can the letters in any four-letter word be arranged? *(Assuming all letters are different)*

   (d) How many different 4-letter arrangements are possible using any 2 letters from the word SMILE and any 2 letters from the word FROG?

7. A student council consists of 7 girls and 5 boys. A subcommittee of four council members is needed to coordinate a school dance. How many ways can this be done if:
   (a) There are no restrictions

   (b) There must be exactly 2 boys and 2 girls

   (c) There must be exactly 2 boys and 2 girls, and the council president Claire (girl) must be on the subcommittee?

   (d) If either Claire **or** the vice-president David (boy) must on the subcommittee. (Hint: Consider two different cases)

   (e) There must be at least one boy on the subcommittee.

BONUS: A pizzeria offers a $9.99 special, where a medium pizza with up to five toppings can be ordered. (That is, a customer can order less toppings if they wish) Assuming double-toppings are not permitted, a plain cheese pizza counts as no toppings, and there are 12 toppings to choose from, determine the total number of orders possible.