Name:_____

MA 2080: Worksheet 4

1. Answer the following questions given the description of sets A and B below.

   - $n(U) = 100$
   - $n(A) = 20$
   - $n(B) = 30$
   - $n(A \cup B) = 12$

   (a) Draw a Venn diagram for the data.

   (b) $n(A \cap B)$

   (c) $n(A^c)$

   (d) $n(A \cap B^c)$

   (e) $n(A^c \cap B)$

   (f) $n((A \cup B)^c$

2. For the following table . How many total Giants fans are there? How many total Jets fans are there? Make a Venn diagram representing the data for Giants and Jets ignoring anything about the the baseball. Assume a Jets fan is not a Giants fan and vice versa. Similarly for Mets and Yankees.

	Mets	Yankees
Giants	150	422
Jets	250	178

   What is fundamentally different from the data given in question 1 and question 2? The Venn diagrams may assist.

3. For the table in Question 2 make a tree diagram starting with baseball, then football.

   (a) $n(G)$

   (b) $n(J)$

   (c) $n(G)$

   (d) $n(G)$

4. For the table in Question 2 make a tree diagram starting with baseball, then football.

5. For the table in Question 2 make a tree diagram starting with football, then baseball.

6. How many 3-letter code words can be formed from the letters A, B, C, D, E if no letter is repeated? If letters can be repeated? If adjacent letters must be different?

7. Calculating factorials

(a) 3!

(b) 4!

(c) 2!4!

(d) $\frac{7!}{5!}$

(e) $\frac{7!}{5!2!}$

(f) $\frac{6!}{3!3!}$

8. Calculating Combinations and Permutations

   (a) $_7P_7$

   (b) $_7P_1$

   (c) $_7C_0$

   (d) $_7P_5$

   (e) $_7C_5$

   (f) $_6C_3$

   (g) $_7C_7$

   (h) $_7C_2$

9. A book club meets monthly at the home of one of its 10 members. In December, the club selects a host for each meet- ing of the next year.

10. In a horse race, how many different finishes among the first 3 places are possible if 10 horses are running? (Exclude ties.)

11. In a long-distance foot race, how many different finishes among the first 5 places are possible if 50 people are running? (Exclude ties.)

12. How many ways can a 3-person subcommittee be selected from a commit- tee of 7 people? How many ways can a presi- dent, vice-president, and secretary be chosen from a commit- tee of 7 people?

13. Nine cards are numbered with the digits from 1 to 9. A 3-card hand is dealt, 1 card at a time. How many hands are possible in which

   (a) Order is taken into consideration?

   (b) Order is not taken into consideration?

14. From a standard 52-card deck, how many 3-card hands have all cards from the same suit?

15. From a standard 52-card deck, how many 5-card hands have all cards from the same suit?