Name **MAT 340-Statistics FOR BEHAVORIAL SCIENCE**
Date **Assignment #5**

1. Use the following table to answer questions (a)-(e):

The following table gives the two-way classification of 500 students based on sex and whether or not they suffer from math anxiety.

	Suffer From Math Anxiety	
Sex	**Yes**	**No**
Male	167	73
Female	168	92

(a) If you randomly select one student from these 500 students, the probability that this selected student is a female is: (round your answer to three decimal places, so 0.0857 would be 0.086)

(b) If you randomly select one student from these 500 students, the probability that this selected student suffers from math anxiety is: (round your answer to three decimal places, so 0.0857 would be 0.086)

(c) If you randomly select one student from these 500 students, the probability that this selected student suffers from math anxiety, given that he is a male is: (round your answer to three decimal places, so 0.0857 would be 0.086)

(d) If you randomly select one student from these 500 students, the probability that this selected student is a female, given that she does not suffer from math anxiety is: (round your answer to three decimal places, so 0.0857 would be 0.086)

(e) Which of the following pairs of events are mutually exclusive? (Note: Make only one choice from the following options)

1) Female and male
2) Female and no
3) Female and yes
4) Male and no
5) Male and yes
6) No and yes

2. The athletic department of a school has 12 full-time coaches, and 4 of them are female. The director selects two coaches at random from this group. The probability (to three decimal places) that neither of them is a female is:

3. The probability that an adult possesses a credit card is 0.71. A researcher selects two adults at random. The probability (rounded to three decimal places) that the first adult possesses a credit card and the second adult does not possess a credit card is:

4. The probability that a student at a university is a male is 0.52, that a student is a business major is 0.17, and that a student is a male and a business major is 0.08. The probability that a randomly selected student from this university is a male or a business major is:

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PERMUATION & COMBINATION SECTION

1. There are 12 people on a basketball team, and the coach needs to choose 5 to put into a game. How many different possible ways can the coach choose a team of 5 if each person has an equal chance of being selected?

(1) ${}_{12}P_5$ (3) ${}_{12}C_5$

(2) ${}_{5}P_{12}$ (4) ${}_{5}C_{12}$

2. Six members of a school's varsity tennis team will march in a parade. How many different ways can the players be lined up if Angela, the team captain, is always at the front of the line?

3. How many different five-member teams can be made from a group of eight students, if each student has an equal chance of being chosen?

(1) 40 (3) 336

(2) 56 (4) 6,720

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4. A certain state is considering changing the arrangement of letters and numbers on its license plates. The two options the state is considering are:

Option 1: three letters followed by a four-digit number with repetition of both letters and digits allowed

Option 2: four letters followed by a three-digit number without repetition of either letters or digits

[Zero may be chosen as the first digit of the number in either option.]

Which option will enable the state to issue more license plates? How many *more* different license plates will that option yield?

5. In a game, each player receives 5 cards from a deck of 52 different cards. How many different groupings of cards are possible in this game?

(1) ${}_{52}P_5$ (3) $\frac{52!}{5!}$

(2) ${}_{52}C_5$ (4) 5!

6. How many different three-member teams can be selected from a group of seven students?

(1) 1 (3) 210

(2) 35 (4) 5,040

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7. An algebra class of 21 students must send 5 students to meet with the principal. How many different groups of 5 students could be formed from this class?

8. The value of $\frac{7!}{3!}$ is

(1) 840 (3) 7

(2) 24 (4) 4

9. The expression ${}_9C_2$ is equivalent to

(1) ${}_9P_2$ (3) ${}_9C_7$

(2) ${}_9P_7$ (4) $\frac{9!}{2!}$

10. Max goes through the cafeteria line and counts seven different meals and three different desserts that he can choose. Which expression can be used to determine how many different ways Max can choose a meal and a dessert?

(1) 7•3 (3) ${}_7C_3$

(2) 7! •3! (4) ${}_7P_3$

11. If the Math Olympiad Club consists of eighteen students, how many different teams of four students can be formed for competitions?

(1) 66 (3) 3,060

(2) 72 (4) 73,440

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12. In the next Olympics, the United States can enter four athletes in the diving competition. How many different teams of four divers can be selected from a group of nine divers?

(1) 36 (3) 3,024
(2) 126 (4) 6,561

13. Five friends met for lunch, and they all shook hands. Each person shook the other person's right hand only once. What is the total number of handshakes?

14. A committee of five members is to be randomly selected from a group of nine freshmen and seven sophomores. How many different committees of three freshmen and two sophomores can be chosen?

15. On a bookshelf, there are five different mystery books and six different biographies. How many different sets of four books can Emilio choose if two of the books must be mystery books and two of the books must be biographies?

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MULTIPLE CHOICE SECTION

1. Which of the following is a requirement for a random sample?
   a. Every individual has an equal chance of being selected.
   b. The probabilities cannot change during a series of selections.
   c. There must be sampling with replacement.
   d. Each of the other 3 choices are correct.

2. A class consists of 10 male students and 30 female students. If one student is randomly selected from the class, what is the probability of selecting a male student?
   a. $p = 10/30$
   b. $p = 10/40$
   c. $p = 1/10$
   d. $p = 1/40$

3. A class consists of 10 male and 30 female students. A random sample of $n = 3$ students is selected with replacement. If the first two students are both females, what is the probability that the third student is a male?
   a. $p = 10/37$
   b. $p = 10/38$
   c. $p = 10/40$
   d. $p = 8/38$

4. Which statement accurately describes the proportions in the tails of a normal distribution?
   a. Proportions in both the left-hand and right-hand tails tend to be relatively small.
   b. Proportions in both the left-hand and right-hand tails tend to be relatively large.
   c. The proportion in the left-hand tail is larger than the proportion in the right-hand tail.
   d. The proportion in the right-hand tail is larger than the proportion in the left-hand tail.

5. Which statement accurately describes the proportions in the tails of a normal distribution?
   a. The proportion in the left-hand tail is smaller than the proportion in the right-hand tail.
   b. Proportions in both the left-hand and right-hand tails tend to be relatively large.
   c. Proportions in both tails are the same.
   d. Proportions in both tails are negative.