

1st Semester Extra Credit Assignment

Requirements/Expectations:

- 1) You must print the packet(s) yourself.**
- 2) All problems must be completed or I will not grade it.**
- 3) Problems will be checked for ACCURACY. Any packet that has more than 20% of the problems wrong will not be given credit.**
- 4) You must complete the work yourself and SHOW YOUR WORK.**
- 5) I will not answer questions about problems from the packet before May 19th. (What this means: If you do not want to stay for "Senior Jail", you need to use other resources to help you complete the packet. This includes your classmates, the internet, etc.)**

*****Packets that meet the above requirements and expectations will result in replacement of up to 10 practice grades per semester being replaced with 100%.***

DUE DATE: Packets are due on May 18th if you do not want to stay for Senior Jail. If you do not turn them in by May 18th you **MUST** come to Senior Jail to complete the packets. I will not accept packets after May 18th from students that do not come to Senior Jail.

I have read and understand the requirements and expectations listed above. I understand that whether these requirements have been met is at the sole discretion of Ms. Hajduk and that not meeting these expectations and requirements may result in receiving no extra credit.

Print Name

Signature

Date

****PLEASE ATTACH SEPARATE SHEETS OF PAPER WITH YOUR WORK.**

- How many 5 digit zip codes could you create if the first digit consists of the numbers 1-9, the second digit is the number 2 or 5, and the remaining 3 digits can be the #'s 0-9. Repetition is allowed.
- How many 6 digit license plates could you create if the first 2 digits are numbers 1-9, the 2nd 4 are letters, and repetition is not allowed?
- How many 3 digit area codes could you create if the first digit must be a number 1-9, the second number can be a 0 or 1, and the 3rd number is 5-9 if the 2nd is 0 or 0-4 if the 2nd is a 1. Repetition is allowed.

Complete the following table:

Tires	P250/70R14	P265/75R14
Width (mm)	4.	5.
Aspect ratio (%)	6.	7.
Height (in)	8.	9.
Diameter (in)	10.	11.
Circumference (in)	12.	13.

- If the odometer reads 30,000, what is the actual mileage traveled on the new tires?
- If the speedometer reads 45 mph, what is the actual speed with the new larger tires?
- If Sara had the following test score: 80, 75, 65, 65, & 70, what would her test average be?
- Given the following grading system: Tests-50%
Quiz: 30%
Homework: 20%
What will John's average be if his test average is 85, quiz average is 95, and homework average is 25.
- If John's test average was 10 points higher, what would his final average be?
- Under this system if John's test average was 58, and his quiz average was 73, what would his homework average have to be in order to have a final average of at least 70?
- If John's teacher used a different scale where Tests were 70%, quizzes were 30%, and homework held no value, what would his final average be given a test average of 85, quiz average of 95, and homework average of 25?
- A **check digit** is used to help validate credit card numbers. The credit card companies use the Codabar method to determine the check digit. This method consists of the following steps:
 - Add the digits in the odd-numbered positions and double this total.
 - Add the *number* of odd-position digits that are more than 4 to the total.
 - Add the even-position digits.
 - Choose a check digit that makes this calculation total a number whose final digit is 0.

Find the check digit (**d**) for the VISA card 1234 5678 9012 131**d**.
- Using the information from #21, verify whether or not the following credit card numbers are valid:
 - 7742 1203 0336 7787
 - 1234 9876 6543 0033
 - 6001 5548 5791 7811

23. The check digit in a UPC number (that is, the twelfth digit) is determined in the following manner:

- Multiply the first digit by 3.
- Add the second digit.
- Multiply the third digit by 3.
- Add the fourth digit.
- Continue this alternating process for the Digits 5 to 12.

Determine the check digit (**d**) for the UPC number 01234567890**d**.

24. Using the information from #23, verify whether or not the following UPC codes are valid:

- a) 0 51131 85124 5 b) 0 233601 25654 7 c) 0 49022 22387 5

25. Determine the number of combinations or permutations exist for each scenario.

- a) An airline chooses 5 people from a group of 24 eligible passengers to be moved from coach to 1st class.
- b) A 1st, 2nd, and 3rd place are chosen from 13 entries in a chili cook-off.
- c) Terri buys 7 fish for her aquarium, choosing from 30 fish at the store.

Formulas: $SLG = \frac{(1\gamma S) + (2\gamma D) + (3\gamma T) + (4\gamma HR)}{AB}$ $QR = \frac{25 + 10(\%COMP) + 40(\%TD) - 50(\%INT) + 50(YD)}{12}$

26. Fill in the following table using the slugging average formula.

	Player 1	Player 2	Player 3
Singles	154	129	
Doubles	12		23
Triples	7	10	0
Homeruns	10	15	26
Hits		160	
At Bats	350		413
SLG		.513	.634

27. Find the quarterback rating for the season for a player that passed for a total of 1,756 yards, made 25 complete passes with 7 touchdown passes, and 3 interceptions out of 76 attempts.

28. Find the average number of yards a quarterback passed for if they completed 31 passes out of 79 attempts with 3 touchdowns, and 10 interceptions. Then find the total number of yards.

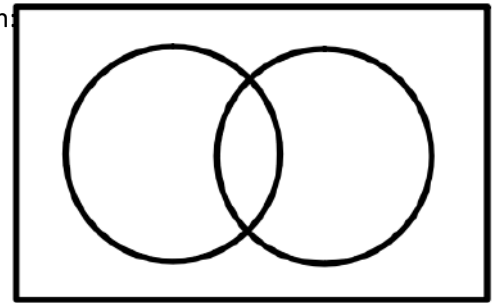
165 people were asked about their preferences regarding Adidas athletic shoes and Nike athletic shoes.

29. Fill in and LABEL the Venn diagram below according to the following information:

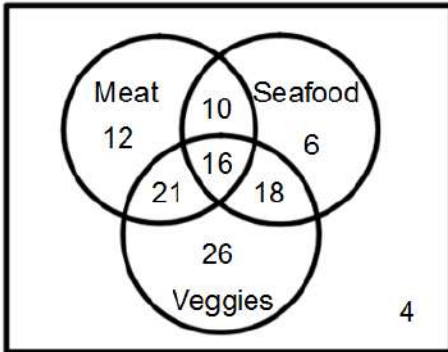
- 76 people liked Adidas.
- 50 people liked both Adidas and Nike.
- 10 didn't like shoes at all :o)

30. How many people liked ONLY Adidas athletic shoes? _____

31. What proportion of people liked BOTH kinds of shoes? _____



Given the Venn Diagram below, answer the following questions. The diagram shows the answers people gave to the question, "What type or types of food do you enjoy eating?"



32. What does the 10 represent? _____

33. How many people were surveyed? _____

34. How many people like meat? _____

35. What percent of people like seafood, but not veggies? _____

36. What proportion of people like ONLY meat? _____

37. What proportion of people like all 3 types of food? _____

I have a spinner with equally sized sections numbered 1-12. Draw a Venn diagram to help you if necessary.

38. Identify the sample space, based on spinning the spinner one time: $S = \{ \quad \quad \quad \}$

39. Define the event space for event A, if A means "spinning an odd number": $A = \{ \quad \quad \quad \}$

40. Define the event space for event B, if B means "factors of 10": $B = \{ \quad \quad \quad \}$

What elements are included in the following sets:

41. $A \cap B$ _____

42. $(A \cup B)'$ _____

43. $A \cup B'$ _____

44. $(A' \cap B)'$ _____

Find the associated probabilities for a random spin of the spinner to land on a value in the following sets:

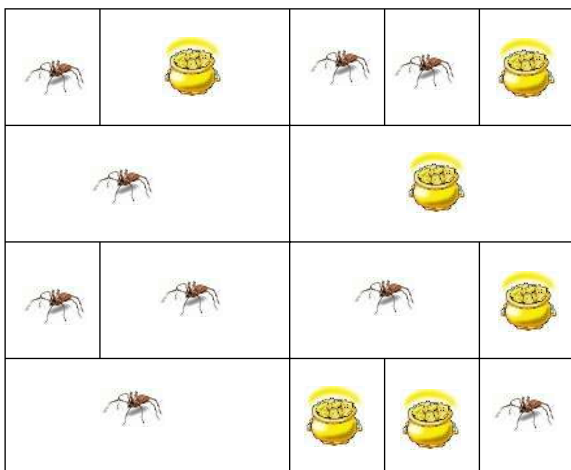
45. $P(A \cup B)$ _____

46. $P(A' \cup B)$ _____

47. $P(A' \cap B')$ _____

48. $P(A' \cup B')$ _____

Use the area model below to answer questions 21 and 22.



49. What is the probability of leaving the maze with a pot of gold? _____

50. If 1632 people go through the maze, how many will leave with a pot of gold? _____

51. I am choosing my outfit for the day. I have 6 red shirts and 2 black shirts for my tops and 3 pairs of khakis and 3 pairs of jeans for my bottoms. **Draw a tree diagram and label the branches with the associated probabilities.**

52. What is the probability that I choose to wear a red shirt and jeans? _____

53. What is the probability I do not choose to wear khakis? _____

54. What is the probability I will choose to wear a black shirt? _____

Identify the following as dependent or independent events.

55. Flipping a coin and rolling a die. _____

56. Drawing a ball out of a bag, keeping it, and drawing another ball. _____

57. Choosing an appetizer, an entrée, and a dessert from a menu. _____

58. Choosing one student to go on a field trip and then choosing another. _____

59. Choosing a math class to take and choosing a science class to take. _____

Find the probability of the following events. Reduce if necessary.

60. Given a regular 10-sided die, what is the probability of rolling a multiple of 2? _____

61. Patty has a box of 10 colored pencils. There are 1 blue, 2 red, 3 green, 1 orange, and 3 yellow. If she closes her eyes and chooses a pencil. What is the probability she will choose a blue or yellow? _____

62. A spinner is divided into 10 equal sections numbered 1 through 10. What is the probability of spinning an even number or 5? _____

A jar contains 7 white chips, 9 purple chips, and 3 black chips. Chips are selected randomly one at a time, and are NOT REPLACED. Find the probability of the following. Reduce if necessary.

63. P(purple then black) _____ 64. P(2 whites) _____ 65. P(white, purple, black) _____

Find the probability of drawing the given cards from a standard 52-card deck (a) with replacement and (b) without replacement. REMINDER: 52 cards in a deck, 4 of each kind (A, 2, ..., 10, J, Q, K), and 13 of each suit (♠, ♣, ♥, ♦)

66. a king, then a Jack a) _____ b) _____

67. two heads a) _____ b) _____

Find the probability of the following events. Reduce if necessary.

68. Four coins are tossed. What is the probability of tossing all heads? _____

69. Reggie rolls a 6-sided die and flips a coin. What is the probability that he will roll a 2 or 3 and flip heads? _____

Nik has a jar that contains 8 green marbles, 2 orange marbles, 9 black marbles, 3 blue marbles. Find the following probabilities.

70. Nik's brother likes to steal his marbles. What is the probability that his brother steals a black marble, then a blue marble? _____

71. Nik only plays with one marble at a time. What is the probability that he will play with a green marble, then a black marble? _____

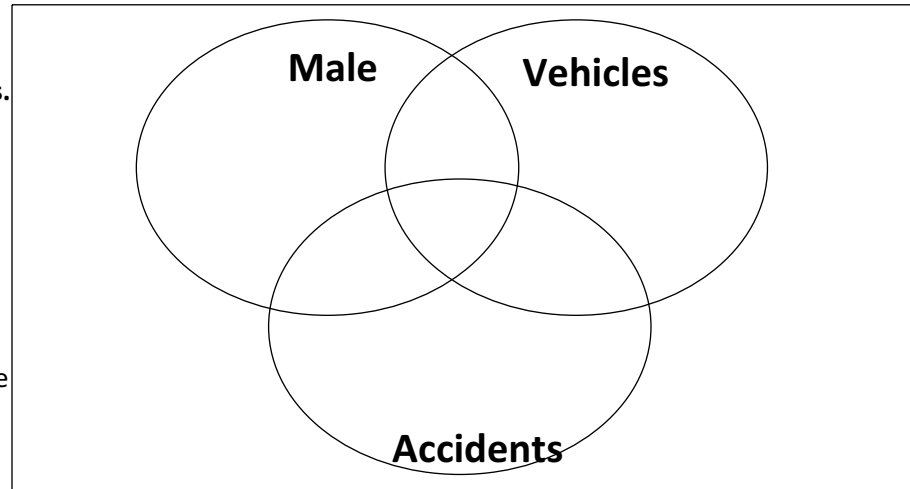
72. Nik gives marbles to girls that he likes, if there are 3 girls that he likes, what is the probability he gives them all orange marbles? _____

Javier decided to survey 700 students, 375 of whom were male, to help him convince his mother to allow him to get a vehicle. No student has both a car and a motorcycle. The following are data from Javier's survey.

	Type of Vehicle	
	Car	Motorcycle
Males with vehicle	250	33
Males involved in accident	67	11
Females with vehicle	275	26
Females involved in accident	22	5

73. Fill in the Venn diagram with the relevant information. (Hint: 2 sections will not have anything in them.)

Use the table and Venn diagram to answer the following questions.



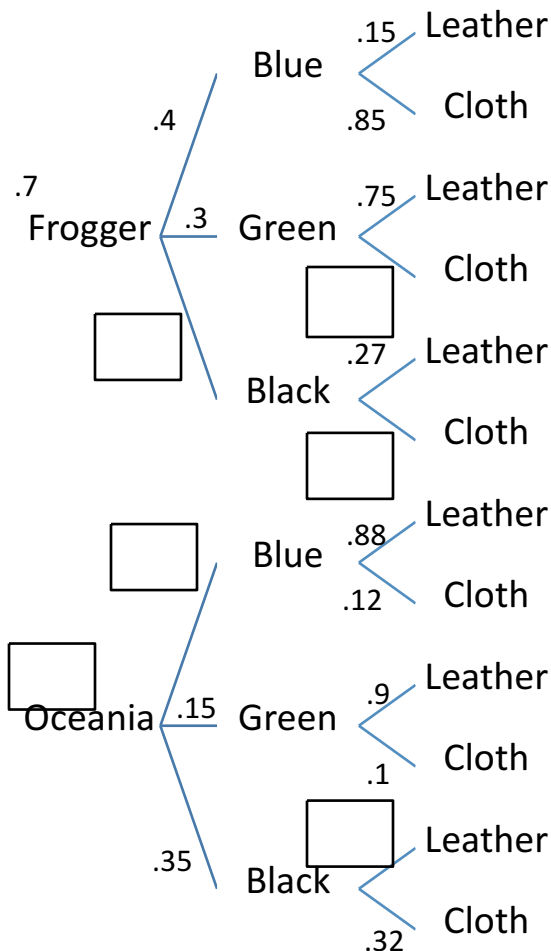
74. What is the probability that Javier will be involved in an accident if he gets a motorcycle?

75. How many males did not have vehicles?

76. How many females do not have vehicles?

77. What proportion of females drive motorcycles?

Jamal works at a car dealership and wants to know about the preferences of the buyers that come to him. The tree diagram below represents what he found:



78. Fill in the missing probabilities on the tree diagram.

79. What is the probability that the next person that comes in will buy a blue Oceania?

80. If 235 customers come buy a car in the next year, approximately **how many** will buy a blue Frogger?

81. What is the probability that the next person that comes in will **NOT** buy a black Oceania with cloth interior?

82. What is the probability that the next person that comes in will buy a black Frogger with cloth interior **OR** a green Oceania with leather interior?

83. Identify which of the following methods: Simple Random Sample, stratified, cluster, convenience, systematic, voluntary response, is used in the following sampling scenarios.

- a) Every fifth person boarding a plane is searched thoroughly.
 - b) At a local community College, five math classes are randomly selected out of 20 and all of the students from each class are interviewed.
 - c) A researcher randomly selects and interviews fifty male and fifty female teachers.
 - d) A researcher for an airline interviews all of the passengers on five randomly selected flights.
 - e) Based on 12,500 responses from 42,000 surveys sent to its alumni, a major university estimated that the annual salary of its alumni was 92,500.
 - f) A community college student interviews everyone in a biology class to determine the percentage of students that own a car.
 - g) A market researcher randomly selects 200 drivers under 35 years of age and 100 drivers over 35 years of age.
 - h) All of the teachers from 85 randomly selected nation's middle schools were interviewed.
 - i) To avoid working late, the quality control manager inspects the last 10 items produced that day.
 - j) The names of 70 contestants are written on 70 cards. The cards are placed in a bag, and three names are picked from the bag.
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84. Explain what bias there is in a study done entirely online.

85. A local newspaper ran a survey by asking, "Do you support the development of a weapon that could kill millions of innocent people?" Determine whether the survey questions is biased and why.

86. Identify in context the type of bias (if there is any) present in the following sampling situations:

- a. Horizon Wireless is thinking of entering the satellite TV business. Their planning department decides to survey their existing cell phone customers regarding their interest in satellite TV.
 - b. The Houston Police Department is concerned about its public image so they develop a survey to be administered by uniformed police officers to a randomly chosen sample of households.
 - c. Prior to graduation each member of the senior class is required to participate in a survey about their school experiences. In order to walk at graduation they need to complete the survey online.
 - d. A car dealer wants to estimate the mean number of cars per household in a medium sized city. He obtains detailed aerial photographs of the city and randomly selects 250 locations on the map. The house nearest each selected location is identified and an employee is sent to that home to ask the owner how many cars they own. The employee follows up until each home responds.
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87. Determine whether the data are qualitative or quantitative (discrete or continuous):

- a) the colors of automobiles on a used car lot
- b) the numbers on the shirts of a girl's soccer team
- c) the ratings of a movie ranging from "poor" to "good" to "excellent"
- d) number of milligrams of tar in 28 cigarettes
- e) the ages of a sample of 350 employees of a large hospital
- f) marriage status of the faculty at the local community college

88. Determine if the below situations are observational studies or experiments—and why.

- a) Over a 4-month period, among 30 people with bipolar disorder, patients who were given a high dose (10g/day) of omega-3 fats from fish oil improved more than those given a placebo. (Archives of General Psychiatry 56 [1999]: 407)
- b) The leg muscles of men aged 60 to 75 were 50% to 80% stronger after they participated in a 16-week, high-intensity resistance-training program twice a week. (Journal of Gerontology 55A [2000]: B336)
- c) Among a group of disabled women aged 65 and older who were tracked for several years, those who had a vitamin B12 deficiency were twice as likely to suffer severe depression as those who did not. (American Journal of Psychology 157 [2000]: 715)
- d) In 2001 a report in the Journal of the American Cancer Institute indicated that women who work at nights have a 60% greater risk of developing breast cancer. Researchers based these findings on the work histories of 763 women with breast cancer and 741 women without the disease.
- e) In 2002, the journal Science reported that a study of women in Finland indicated that having sons shortened the lifespan of mothers by about 34 weeks per son, but that daughters helped to lengthen the mothers' lives. The data came from church records from the period 1640 to 1870.
- f) Some gardeners prefer to use nonchemical methods to control insect pests in their gardens. Researchers have designed two kinds of traps, and want to know which design will be more effective. They randomly choose 10 locations in a large garden and place one of each kind of trap at each location. After a week, they count the number of bugs in each trap.

89. A study was conducted in which neither the participants nor the research assistants knew who was assigned to the experimental and control groups. This is an example of a _____ study.

90. Identify the population and the variable of interest:

- a) A survey of 1353 American households found that 18% of the households own a computer.

Population: _____

Variable of Interest: _____

b) A recent survey of 2625 elementary school children found that 28% of the children could be classified obese.

Population: _____

Variable of Interest: _____

c) The average weight of every sixth person entering the mall within 3 hour period was 146 lb.

Population: _____

Variable of Interest: _____

d) In a USA Today Internet poll, readers responded voluntarily to the question "Do you consume at least one caffeinated beverage every day?"

Population: _____

Variable of Interest: _____

e) Astronomers typically determine the distance to galaxy (a galaxy is a huge collection of billions of stars) by measuring the distances to just a few stars within it and taking the mean (average) of these distance measurements.

Population: _____

Variable of Interest: _____

91. Researchers wanted a representative sample of Japanese-Americans living in San Francisco. "The procedure was as follows. After consultation with representative figures in the Japanese community, the four most representative blocks in the Japanese area of the city were chosen; all persons resident in those four blocks were taken for the sample. However, a comparison with Census data shows that the sample did not include a high-enough proportion of Japanese with college degrees".

a. What kind of sampling did this study use?

b. Why do you suppose the sample did not have enough college graduates?

92. The headline on page 11 of an Illinois newspaper stated, "More people using drugs at work, survey reports." The article gave the following information: "The survey questioned 227 people who called the national [cocaine] helpline, chosen at random, during a six-week period in February and March...Ninety-two percent of the callers said they sometimes worked while under the influence of drugs" (Rockford Register Star, March 25, 1985).

a. What kind of sampling was used?

b. What population would you say this sample was drawn from?

c. Describe why this survey does not justify the claim made in the headline.

Find the MEAN, MEDIAN, and RANGE of each of the following data sets:

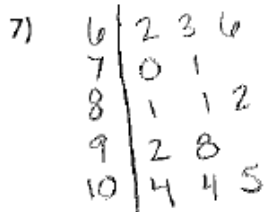
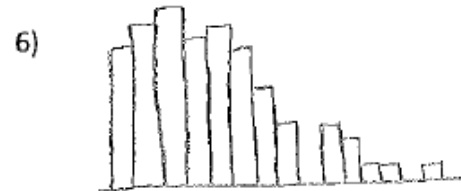
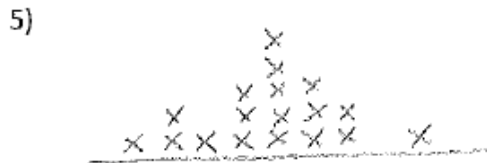
1) 3, 4, 6, 10, 11, 15, 62

2) 265, 290, 291, 302, 310, 314, 314, 315, 316

3) .03, .05, .06, .06, .08, .11, .11, .11

4) 2.4, 2.4, 2.4, 2.4, 2.4, 2.4, 2.4, 2.4, 2.4, 672

Describe each of the following distributions as NORMAL, UNIFORM, SKEWED RIGHT, or SKEWED LEFT.



Fill in the blanks for the following statements:

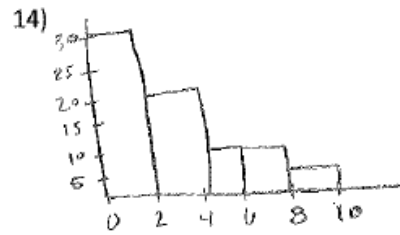
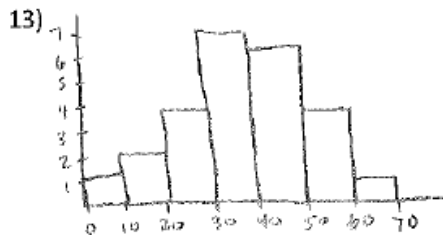
9) In a symmetric distribution, the mean is _____ the median.

10) In a skewed RIGHT distribution, the mean is _____ the median.

11) In a skewed LEFT distribution, the mean is _____ the median.

12) In a non-symmetric distribution, the _____ is a better measure of center than the _____.

Using the histograms below, describe the SHAPE and then identify the MEDIAN of each distribution. (hint: use the frequencies to first figure out how many observations are being represented, then find the location of the middle value).



Using the stem-and-leaf plots below, describe the SHAPE and then identify the MEAN and MEDIAN values of each set.

