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1. If A denotes some event, what does $\overline{A}$ denote? If P(A) = 0.003, what is the value of $P(\overline{A})$? If P(A) = 0.003, is $\overline{A}$ unusual?

What does $\overline{A}$ denote?

- ○ A. Event $\overline{A}$ denotes the complement of event A, meaning that $\overline{A}$ consists of all outcomes in which event A does not occur.
- ○ B. Events A and $\overline{A}$ share all outcomes.
- ○ C. Event $\overline{A}$ denotes the complement of event A, meaning that $\overline{A}$ and A share some but not all outcomes.
- ○ D. Event $\overline{A}$ is always unusual.

If P(A) = 0.003, what is the value of $P(\overline{A})$?

$P(\overline{A}) =$ ☐ (Type an integer or a decimal.)

If P(A) = 0.003, is $\overline{A}$ unusual?

- ○ No
- ○ Yes

2. You are certain to get 3 jacks when when selecting 51 cards from a shuffled deck. Express the indicated degree of likelihood as a probability value between 0 and 1 inclusive.

The probability is ☐.
(Type an integer or a decimal.)

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3. Which of the following values cannot be probabilities?

$0, \sqrt{2}, 1, 5/3, 1.41, 3/5, -0.57, 0.02$

Select all the values that **cannot** be probabilities.

- ☐ A. 0
- ☐ B. 0.02
- ☐ C. $\sqrt{2}$
- ☐ D. 1
- ☐ E. 1.41
- ☐ F. $\frac{5}{3}$
- ☐ G. $\frac{3}{5}$
- ☐ H. -0.57

4. To the right are the outcomes that are possible when a couple has three children. Refer to that list, and find the probability of each event.
a. Among three children, there are exactly 2 girls.
b. Among three children, there are exactly 0 girls.
c. Among three children, there is exactly 1 girl.

1st	2nd	3rd
boy	boy	boy
boy	boy	girl
boy	girl	boy
boy	girl	girl
girl	boy	boy
girl	boy	girl
girl	girl	boy
girl	girl	girl

a. What is the probability of exactly 2 girls out of three children?

☐ (Type an integer or a simplified fraction.)

b. What is the probability of exactly 0 girls out of three children?

☐ (Type an integer or a simplified fraction.)

c. What is the probability of exactly 1 girl out of three children?

☐ (Type an integer or a simplified fraction.)

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5. Refer to the sample data below. Complete parts (a) through (d).

	Did the Subject Actually Lie?	
	No (Did Not Lie)	**Yes (Lied)**
Positive test results	14	45
Negative test results	29	11

a. How many responses are summarized in the table?

☐

(Simplify your answer.)

b. How many times did the polygraph provide a negative test result?

☐

(Simplify your answer.)

c. If one of the responses is randomly selected, find the probability that it is a negative test result?

P(negative test result) = ☐

(Type an integer or a simplified fraction.)

d. Express the answer from part (c) as a decimal.

P(negative test result) = ☐

(Round to three decimal places as needed.)

6. Refer to the sample data below. If one of the responses is randomly selected, what is the probability that it is a false positive? What does this probability suggest about the accuracy of the polygraph test?

	Did the Subject Actually Lie?	
	No (Did Not Lie)	**Yes (Lied)**
Positive test results	17	46
Negative test results	29	7

P(false positive) = ☐

(Round to three decimal places as needed.)

The polygraph test is ☐ because the probability of having a false positive is ☐.

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7. In a sample of 100 colored candies, there are 17 red candies, 3 blue candies, 19 yellow candies, and 61 brown candies.
a. Estimate the probability that when a candy is randomly selected, it is one that is blue.
b. The maker of the candy claims that 24% of its candies are blue. Does the estimate from part (a) roughly agree with this claim, or does there appear to be substantial disagreement?

a. The probability of randomly drawing a blue candy is ☐.
(Type a decimal or fraction.)

b. Does the estimate roughly agree with the claim?

- ○ Yes
- ○ No

8. In a test of a gender-selection technique, results consisted of 217 baby girls and 202 baby boys. Based on this result, what is the probability of a girl born to a couple using this technique? Does it appear that the technique is effective in increasing the likelihood that a baby will be a girl?

The probability that a girl will be born using this technique is approximately ☐.
(Type an integer or decimal rounded to three decimal places as needed.)

Does the technique appear effective in improving the likelihood of having a girl baby?

- ○ No
- ○ Yes

9. If a couple were planning to have three children, the sample space summarizing the gender outcomes would be: bbb, bbg, bgb, bgg, gbb, gbg, ggb, ggg.
a. Construct a similar sample space for the possible weight outcomes (using o for overweight and u for underweight) of two children.
b. Assuming that the outcomes listed in part (a) were equally likely, find the probability of getting two underweight children.
c. Find the probability of getting exactly one overweight child and one underweight child.

a. What is the sample space?

☐ (Use a comma to separate answers as needed.)

b. Find the probability of getting two underweight children

☐ (Type an exact answer.)

c. Find the probability of getting one overweight child and one underweight child.

☐ (Type an exact answer.)

10. A modified roulette wheel has 40 slots. One slot is 0, another is 00, and the others are numbered 1 through 38, respectively. You are placing a bet that the outcome is an even number. (In roulette, 0 and 00 are neither odd nor even.)

a. What is your probability of winning?

The probability of winning is ☐.
(Type an integer or a simplified fraction.)

b. What are the actual odds against winning?

The actual odds against winning are ☐:☐.

c. When you bet that the outcome is an even number, the payoff odds are 1:1. How much profit do you make if you bet $11 and win?

If you win, the payoff is $☐.

d. How much profit should you make on the $11 bet if you could somehow convince the casino to change its payoff odds so that they are the same as the actual odds against winning?

$☐ (Round to the nearest cent as needed.)

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11. A single trial of some procedure is conducted and the resulting events are analyzed. Describe what it means for two events in a single trial to be disjoint.

Choose the correct answer below.

- ○ A. The events cannot happen at the same time.
- ○ B. The events cannot combine two or more simple events.
- ○ C. The events always happen at the same time.
- ○ D. The events combine two or more simple events.

12. Decide whether the following two events are disjoint.
1. Randomly selecting someone who smokes cigars
2. Randomly selecting a male

Are the two events disjoint?

- ○ A. No, because the events cannot occur at the same time.
- ○ B. No, because the events can occur at the same time.
- ○ C. Yes, because the events can occur at the same time.
- ○ D. Yes, because the events cannot occur at the same time.

13. Determine whether the two events are disjoint for a single trial. (Hint: Consider "disjoint" to be equivalent to "separate" or "not overlapping".)

Randomly selecting a violin from the instrument assembly line and getting one that is free of defects.
Randomly selecting a violin from the instrument assembly line and getting one with a warped neck.

Choose the correct answer below.

- ○ A. The events are not disjoint. They can occur at the same time.
- ○ B. The events are not disjoint. The first event is not the complement of the second.
- ○ C. The events are disjoint. They cannot occur at the same time.
- ○ D. The events are disjoint. The first event is the complement of the second.

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14. Answer the following questions.

a. If $P(A) = 0.48$, find the complement of A, $P(\overline{A})$.
b. A certain group of women has a 0.49% rate of red/green color blindness. If a woman is randomly selected, what is the probability that she does not have red/green color blindness?

a. $P(\overline{A}) =$ ☐ (Type an exact answer in simplified form.)

b. What is the probability that the woman selected does not have red/green color blindness?
☐ (Type an exact answer in simplified form.)

15. The following data summarizes results from 923 pedestrian deaths that were caused by accidents. If one of the pedestrian deaths is randomly selected, find the probability that the pedestrian was intoxicated or the driver was intoxicated.

		Pedestrian	
		intoxicated	not intoxicated
Driver	intoxicated	56	72
	not intoxicated	292	503

P(pedestrian or driver were intoxicated) = ☐
(Do not round until the final answer. Then round to three decimal places as needed.)

16. The following data summarizes results from 915 pedestrian deaths that were caused by accidents. If one of the pedestrian deaths is randomly selected, find the probability that the pedestrian was intoxicated or the driver was not intoxicated.

		Pedestrian Intoxicated?	
		Yes	No
Driver intoxicated?	Yes	79	58
	No	246	532

P(pedestrian was intoxicated or driver was not intoxicated) = ☐
(Do not round until the final answer. Then round to three decimal places as needed.)

17. The data in the following table summarizes blood groups and Rh types for 100 typical people. If one person is randomly selected, find the probability of getting someone who is not group O.

		Group			
		O	A	B	AB
Type	Rh^+	33	35	9	3
	Rh^-	9	7	3	1

P(person selected is not group O) = ☐
(Do not round until the final answer. Then round to three decimal places as needed.)

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18. The data in the following table summarizes blood groups and Rh types for 101 typical people. If one person is randomly selected, find P(not type Rh^-).

		Group			
		O	A	B	AB
Type	Rh^+	31	35	8	4
	Rh^-	5	9	5	4

P(not type Rh^-) = ☐

(Do not round until the final answer. Then round to three decimal places as needed.)

19. The data in the following table summarizes blood groups and Rh types for 100 typical people. If one person is randomly selected, find the probability of getting someone who is group AB or type Rh^+.

		Group			
		O	A	B	AB
Type	Rh^+	34	36	7	3
	Rh^-	6	5	4	5

P(person selected is group AB or type Rh^+) = ☐

(Do not round until the final answer. Then round to three decimal places as needed.)

20. Pollsters are concerned about declining levels of cooperation among persons contacted in surveys. A pollster contacts 74 people in the 18-21 age bracket and finds that 52 of them respond and 22 refuse to respond. When 273 people in the 22-29 age bracket are contacted, 253 respond and 20 refuse to respond. Suppose that one of the 347 people is randomly selected. Find the probability of getting someone in the 22-29 age bracket or someone who responded.

P(person is in the 22-29 age bracket or responded) = ☐

(Do not round until the final answer. Then round to three decimal places as needed.)

21. Use the following results from a test for marijuana use, which is provided by a certain drug testing company. Among 142 subjects with positive test results, there are 22 false positive results. Among 151 negative results, there are 4 false negative results. Complete parts (a) through (c). (Hint: Construct a table.)

a. How many subjects were included in the study?

The total number of subjects in the study was ☐.

b. How many subjects did not use marijuana?

A total of ☐ subjects did not use marijuana.

c. What is the probability that a randomly selected subject did not use marijuana?

The probability that a randomly selected subject did not use marijuana is ☐.

(Do not round until the final answer. Then round to three decimal places as needed.)

22. Use the following results from a test for marijuana use, which is provided by a certain drug testing company. Among 147 subjects with positive test results, there are 29 false positive results; among 157 negative results, there are 4 false negative results. If one of the test subjects is randomly selected, find the probability that the subject tested negative or did not use marijuana. (Hint: Construct a table.)

The probability that a randomly selected subject tested negative or did not use marijuana is ☐.
(Do not round until the final answer. Then round to three decimal places as needed.)

23. Describe what the notation $P(B|A)$ represents.

Choose the correct answer below.

- ○ A. The probability of event B occurring, given that event A has already occurred.
- ○ B. The probability of event A occurring, given that event B has already occurred.
- ○ C. The probability of event B and event A occurring.
- ○ D. The probability of event B or event A occurring.

24. For each given pair of events, classify the two events as independent or dependent. (If two events are technically dependent but can be treated as if they are independent, consider them to be independent.)

a. A person finding his microwave not working. / The same person finding his kitchen light not working. Choose the correct answer below.

- ○ A. The events are independent since a person finding his kitchen light not working has no effect on the probability of finding his microwave not working.
- ○ B. The events are independent since a person finding his microwave not working has no effect on the probability of finding his kitchen light not working.
- ○ C. The events are dependent since a person finding his microwave not working has no effect on the probability of finding his kitchen light not working.
- ○ D. The events are dependent since a person finding his microwave not working may increase the probability of finding his kitchen light not working.

b. Randomly selecting a baseball player over the age of 30. / Randomly selecting a second baseball player over the age of 30. Choose the correct answer below.

- ○ A. The events are dependent since randomly selecting a baseball player over the age of 30 may decrease the probability of randomly selecting a second.
- ○ B. The events are independent since randomly selecting a baseball player over the age of 30 has no effect on the probability of randomly selecting a second.
- ○ C. The two events are technically dependent but can be treated as if they are independent because small samples are drawn from a large population.

c. The habit of wearing a wedding ring on the left ring finger. / The probability of getting asked out on a date. Choose the correct answer below.

- ○ A. The habit of wearing a wedding ring on the left ring finger could not affect the probability of getting asked out on a date, so the events are independent.
- ○ B. The habit of wearing a wedding ring on the left ring finger could affect the probability of getting asked out on a date, so the events are dependent.
- ○ C. The probability of getting asked out on a date could affect the habit of wearing a wedding ring on the left ring finger, so the events are dependent.
- ○ D. The habit of wearing a wedding ring on the left ring finger could affect the probability of getting asked out on a date, so the events are independent.

25. For the given pair of events, classify the two events as independent or dependent. (If two events are technically dependent but can be treated as if they are independent according to the 5% guideline, consider them to be independent.)

Waking up and finding the alarm clock blinking 12:00
Getting to class late

Choose the correct answer below.

- ○ A. The two events are independent because the occurrence of one affects the probability of the occurrence of the other.
- ○ B. The two events are dependent because the occurrence of one does not affect the probability of the occurrence of the other.
- ○ C. The two events are dependent because the occurrence of one affects the probability of the occurrence of the other.
- ○ D. The two events are independent because the occurrence of one does not affect the probability of the occurrence of the other.

26. For the given pair of events, classify the two events as independent or dependent. (If two events are technically dependent but can be treated as if they are independent according to the 5% guideline, consider them to be independent.)

Flipping a fair coin and getting tails
Flipping the same coin again and getting heads

Choose the correct answer below.

- ○ The two events are independent because the occurrence of one affects the probability of the occurrence of the other.
- ○ The two events are dependent because the occurrence of one does not affect the probability of the occurrence of the other.
- ○ The two events are independent because the occurrence of one does not affect the probability of the occurrence of the other.
- ○ The two events are dependent because the occurrence of one affects the probability of the occurrence of the other.

27. Use the data in the following table, which summarizes results from 160 pedestrian deaths that were caused by accidents. If two different deaths are randomly selected, find the probability that they both involved intoxicated drivers.

		Pedestrian Intoxicated?	
		Yes	No
Driver Intoxicated?	Yes	18	20
	No	68	54

The probability is ☐. (Round to four decimal places as needed.)

28. The table below contains the results from experiments with a polygraph instrument. If four of the test subjects are randomly selected without replacement, find the probability that, in each case, the polygraph indicated that the subject lied. Is such an event unusual?

	No (Did Not Lie)	Yes (Lied)
Positive test result (Positive test indicated that the subject lied.)	17 (false positive)	67 (true positive)
Negative test result (Polygraph test indicated that the subject did not lie.)	39 (true negative)	8 (false negative)

What is the probability?

☐ (Round to three decimal places as needed.)

Is such an event unusual?

- ○ No
- ○ Yes

29. Refer to the table below. Given that 2 of the 158 subjects are randomly selected, complete parts (a) and (b).

		Group			
		O	A	B	AB
Type	Rh^+	66	54	10	12
	Rh^-	8	6	1	1

a. Assume that the selections are made with replacement. What is the probability that the 2 selected subjects are both group AB and type Rh^+?

☐ (Round to four decimal places as needed.)

b. Assume the selections are made without replacement. What is the probability that the 2 selected subjects are both group AB and type Rh^+?

☐ (Round to four decimal places as needed.)

30. With one method of a procedure called acceptance sampling, a sample of items is randomly selected without replacement and the entire batch is accepted if every item in the sample is okay. A company has just manufactured 1144 CDs, and 570 are defective. If 5 of these CDs are randomly selected for testing, what is the probability that the entire batch will be accepted?

The probability that the whole batch is accepted is ☐.
(Round to the nearest thousandth as needed.)

31. Recent developments appear to make it possible for couples to dramatically increase the likelihood that they will conceive a child with the gender of their choice. In a test of a gender-selection method, 10 couples try to have baby girls.

a. If this gender-selection method has no effect, what is the probability that the 10 babies will be all girls?

The probability is ☐. (Type an integer or a simplified fraction.)

b. If there are actually 10 girls among 10 children, does this gender-selection method appear to be effective? Why?

○A. Yes, the low probability indicates that instead of getting 10 females by chance, a more reasonable explanation is that females appear to be more likely with the gender-selection procedure.

○B. Not necessarily, because the event of getting 10 females by chance is not unusual.

○C. No, the gender-selection procedure cannot have any effect on the genders of the 10 children.

32. The principle of redundancy is used when system reliability is improved through redundant or backup components. Assume that your alarm clock has a 0.81 probability of working on any given morning and answer the questions below.

a. What is the probability that your alarm clock will not work on the morning of an important final exam?

☐ (Type an exact answer in simplified form.)

b. If you have two such alarm clocks, what is the probability that they both fail on the morning of an important final exam?

☐ (Type an exact answer in simplified form.)

c. With one alarm clock, you have a 0.81 probability of being awakened. What is the probability of being awakened if you use two alarm clocks?

☐ (Type an exact answer in simplified form.)

d. Does a second alarm clock result in greatly improved reliability?

- ○ A. Yes, total malfunction would not be impossible, but it would be unusual.
- ○ B. Yes, you can always be certain that at least one alarm clock will work.
- ○ C. No, total malfunction would still not be unusual.
- ○ D. No, the malfunction of both is equally or more likely than the malfunction of one.

33. Determine the written description of the complement of the given event.

When nine digital pianos are tested, at least one of them is free of defects.

Choose the correct answer below.

- ○ A. More than one of them are defective
- ○ B. All of them are free of defects
- ○ C. None of them are defective
- ○ D. All of them are defective

34. Determine the written description of the complement of the given event.

When 14 job applicants are examined, all of them test negative.

Choose the correct answer below.

- ○ A. All of them test positive
- ○ B. At least one of them tests positive
- ○ C. None of them test negative
- ○ D. More than one of them test negative

35. If a couple plans to have 6 children, what is the probability that there will be at least one boy? Assume boys and girls are equally likely. Is that probability high enough for the couple to be very confident that they will get at least one boy in 6 children?

The probability is ☐. (Type an integer or a simplified fraction.)

Can the couple be very confident that they will have at least one boy?

- ○ A. No because the probability is close to 1.
- ○ B. Yes because the probability is close to 0.
- ○ C. No because the probability is close to 0.
- ○ D. Yes because the probability is close to 1.

36. Find the probability of a couple having a baby boy when their third child is born, given that the first two children were both boys. Assume boys and girls are equally likely. Is the result the same as the probability of getting all boys among three children?

The probability is ☐. (Type an integer or a simplified fraction.)

Is this result the same as the probability of getting all boys among three children?

- ○ A. No. The second event involves more possible outcomes.
- ○ B. Yes. The events are all independent.
- ○ C. No. The two events are complements.
- ○ D. Yes. The final result in each case is the same.

37. The probability of a randomly selected car crashing during a year in a certain country is 0.0499. If a family has four cars, find the probability that at least one of them has a car crash during a year. Is there any reason why the probability might be wrong?

The probability that at least one of them has a crash during the year is ☐.
(Round to four decimal places as needed.)

Is there a reason why the probability might be wrong?

- ○ A. No, one outcome does not have an effect on later trials.
- ○ B. Yes, the four cars are not randomly selected.
- ○ C. Yes, one outcome has an effect on later trials.
- ○ D. No, the four cars are representative of all cars in the country.

38. The table below displays results from experiments with polygraph instruments. Find P(subject lied | negative test result). Compare this result with the probability of selecting a subject with a negative test result, given that the subject lied. Are P(subject lied | negative test result) and P(negative test result | subject lied) equal?

	Did the Subject Actually Lie?	
	No (Did Not Lie)	**Yes (Lied)**
Positive test results	18	40
Negative test results	30	9

P(subject lied | negative test result) = ☐ (Round to three decimal places as needed.)

Find the probability of selecting a subject with a negative test result, given that the subject lied.

P(negative test result | subject lied) = ☐ (Round to three decimal places as needed.)

Compare the two values. Are they equal?

- ○ No
- ○ Yes

39. A statistics student wants to ensure that she is not late for an early statistics class because of a malfunctioning alarm clock. Instead of using one alarm clock, she decides to use four. What is the probability that at least one of her alarm clocks works correctly if each individual alarm clock has an 87% chance of working correctly? Does the student really gain much by using four alarm clocks instead of only one? How are the results affected if all of the alarm clocks run on electricity instead of batteries?

The probability that at least one of her alarm clocks works correctly is ☐.
(Round to four decimal places as needed.)

Does the student really gain much by using four alarm clocks instead of only one?

- ○ A. No. The clocks are not independent.
- ○ B. Yes. It is four times as likely that at least one clock will work properly.
- ○ C. Yes. The likelihood of a functioning alarm clock increases dramatically with four alarm clocks.
- ○ D. No. The probability of one alarm clock working is about the same as four alarm clocks working.

How are the results affected if all of the alarm clocks run on electricity instead of batteries?

- ○ A. The results are not affected because all clocks run on the same electricity.
- ○ B. The results change because the alarm clocks are no longer independent.
- ○ C. The results are not affected because the alarm clocks are still independent.
- ○ D. The results change because each clock now has a new probability.

40. A roller coaster has 2 seats in each of 12 rows. Riders are assigned to seats in the order that they arrive. If you ride this roller coaster once, what is the probability of getting the coveted first row? How many times must you ride in order to have at least a 93% chance of getting a first-row seat at least once?

The probability of getting a first-row seat is ☐. (Round to three decimal places as needed.)

How many times must you ride in order to have at least a 93% chance of getting a first-row seat at least once?

☐ times (Round up to the nearest whole number.)

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41. In horse racing, a trifecta is a bet that the first three finishers in a race are selected, and they are selected in the correct order. Does a trifecta involve combinations or permutations? Explain.

Choose the correct answer below.

- ○A. Because the order of the first three finishers does make a difference, the trifecta involves permutations.
- ○B. Because the order of the first three finishers does make a difference, the trifecta involves combinations.
- ○C. Because the order of the first three finishers does not make a difference, the trifecta involves combinations.
- ○D. Because the order of the first three finishers does not make a difference, the trifecta involves permutations.

42. Evaluate the given expression and express the result using the usual format for writing numbers (instead of scientific notation).

$2!$

$2! =$ ☐

43. Evaluate the given expression and express the result using the usual format for writing numbers (instead of scientific notation).

${}_{28}C_3$

${}_{28}C_3 =$ ☐

44. Evaluate the given expression and express the result using the usual format for writing numbers (instead of scientific notation).

${}_{57}P_2$

${}_{57}P_2 =$ ☐

45. Find the probability of winning a lottery with the following rule.

Select the five winning numbers from 1, 2, . . . , 27. (In any order. No repeats.)

P(winning) = ☐ (Type an integer or a simplified fraction.)

46. A certain lottery is won by selecting the correct four numbers from 1, 2, ..., 38. The probability of winning that game is $\frac{1}{73{,}815}$. What is the probability of winning if the rules are changed so that in addition to selecting the correct four numbers, you must now select them in the same order as they are drawn?

P(winning) = ☐ (Type an integer or a simplified fraction.)

47. When testing for current in a cable with twelve color-coded wires, the author used a meter to test five wires at a time. How many different tests are required for every possible pairing of five wires?

The number of tests required is ☐.

48. A certain company reduced its management staff from 20 managers to 16. The company claimed that four managers were randomly selected for job termination. However, the four managers chosen are the four oldest managers among the 20 that were employed. Answer the questions below.

a. Find the probability that when four managers are randomly selected from a group of 20, the four oldest are selected.

The probability is ☐. (Type an integer or a simplified fraction.)

b. Is that probability low enough to charge that instead of using random selection, the company actually fired the oldest employees?

- ○A. Yes, the probability is low enough, therefore, it is possible that the oldest employees were randomly selected.
- ○B. No, the probabilty is not low. Each manager had an equal chance of being fired.
- ○C. No, because it would not be unusual to fire the oldest managers, given that they were randomly selected for termination.
- ○D. Yes, because it would be unusual to fire the oldest managers, if they were really randomly selected for termination.

49. Many newspapers carry a certain puzzle in which the reader must unscramble letters to form words. How many ways can the letters of LEZBA be arranged? Identify the correct unscrambling, then determine the probability of getting that result by randomly selecting one arrangement of the given letters.

How many ways can the letters of LEZBA be arranged?

☐

What is the correct unscrambling of LEZBA?

- ○A. ZEBLA
- ○B. BLAZE
- ○C. ALZBE
- ○D. BEZLA

What is the probability of coming up with the correct unscrambling through random letter selection?

☐ (Type an integer or simplified fraction as needed.)

Student: _____	**Instructor:** Darryl Allen	**Assignment:** Homework 4
Date: _____	**Course:** Elementary Statistics 60157	
Time: _____	**Book:** Triola: Elementary Statistics, 11e	

50. There are 40 members on the board of directors for a certain non-profit institution.

a. If they must elect a chairperson, first vice chairperson, second vice chairperson, and secretary, how many different slates of candidates are possible?

b. If they must form an ethics subcommittee of four members, how many different subcommittees are possible?

a. There are ☐ different slates of candidates possible.

b. There are ☐ different ethics subcommittees possible.

51. A "combination" lock is opened with the correct sequence of three numbers between 1 and 68 inclusive. (A number can be used more than once.) What is the probability of guessing those three numbers and opening the lock with the first try?

P(first guess opens lock) = ☐ (Type an integer or simplified fraction.)

52. In the preliminary test of a gender-selection method, 25 babies were born and 23 of them were boys. Complete parts (a) through (d).

a. Find the number of different possible sequences of genders that are possible when 25 babies are born.

☐

b. How many ways can 23 boys and 2 girls be arranged in a sequence?

☐

c. If 25 babies are randomly selected, what is the probability that they consist of 23 boys and 2 girls?

☐ (Round to seven decimal places as needed.)

d. Does the gender-selection method appear to yield a result that is significantly different from a result that might be expected by random chance?

The gender-selection method ☐ to yield a result that is significantly different from a result that might be expected by random chance.

53. A basket contains 12 eggs, 3 of which are cracked. If we randomly select 7 of the eggs for hard boiling, what is the probability of the following events?
a. All of the cracked eggs are selected.
b. None of the cracked eggs are selected.
c. Two of the cracked eggs are selected.

a. The probability that all of the cracked eggs are selected is ☐.
(Round to four decimal places as needed.)

b. The probability that none of the cracked eggs are selected is ☐.
(Round to four decimal places as needed.)

c. The probability that two of the cracked eggs are selected is ☐.
(Round to four decimal places as needed.)

54. Use the table below to answer the following questions.

	Positive Test Result (Pregnancy is indicated)	Negative Test Result (Pregnancy is not indicated)
Subject is Pregnant	73	6
Subject is Not Pregnant	3	17

a. If one of the 99 test subjects is randomly selected, what is the probability of getting a subject who is pregnant?

P(Pregnant) = ☐ (Type an integer or a simplified fraction.)

b. A test subject is randomly selected and is given a pregnancy test. What is the probability of getting a subject who is pregnant, given that the test result is positive?

P(Pregnant|Positive) = ☐ (Type an integer or a simplified fraction.)