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Date: _____

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Course: QMB 3250 - Spring 2022 - A7

Assignment: Final Exam

1. Four different beverages are sold at a fast-food restaurant: soft drinks, tea, coffee, and bottled water. Answer parts (a) and (b).

a. Explain why the type of beverage sold is an example of a categorical variable. Choose the correct answer below.

- A. **Type of beverage sold is a categorical variable because the values of the variable can only be placed into categories.**
- B. Type of beverage sold is a categorical variable because the values of the variable arise from a measuring process.
- C. Type of beverage sold is a categorical variable because the values of the variable represent quantities.
- D. Type of beverage sold is a categorical variable because the values of the variable arise from a counting process.

b. Explain why the type of beverage is a nominal-scaled variable. Choose the correct answer below.

- A. Type of beverage sold is a nominal-scaled variable because the difference between the measurements is a meaningful quantity that involves a true zero point.
- B. Type of beverage sold is a nominal-scaled variable because the values of the variable have distinct categories in which ranking is implied.
- C. **Type of beverage sold is a nominal-scaled variable because there are no rankings for the different values of the variable.**
- D. Type of beverage sold is a nominal-scaled variable because the difference between measurements is a meaningful quantity but does not involve a true zero point.

2. Businesses in a country are listed by size: small, medium, and large. Explain why business size is an example of a categorical variable.

Choose the correct answer below.

- A. The size of a business is categorical because it has numerical values that arise from a counting process.
- B. The size of a business is categorical because it has numerical values that arise from a measuring process.
- C. The size of a business is categorical because it has values that represent quantities.
- D. **The size of a business is categorical because it has values that can only be placed into categories.**

3. Suppose you read a website that says that children play with toys 20% less when their mother is in the room. On what type of data source is the claim in this story based?

Choose the correct answer below.

- A. These data are responses from a survey.
- B. These data are collected by ongoing business activities.
- C. These data are outcomes of a designed experiment.
- D. **These data are results of an observational study.**
- E. These data are distributed by an organization.

4. The table to the right shows data found at a government census website, under a "Did You Know" panel. What type of data source is the information presented here based on?

	Private Sector Total Employment in a State		
All	2008 Q2	2009 Q2	Change
Female	892,544	852,380	- 4.5%
Male	938,753	892,754	- 4.9%
Real Estate			
Female	76,741	66,611	- 13.2%
Male	84,044	74,547	- 11.3%

Choose the correct answer below.

- A. The information is collected via ongoing business activities.
- B. The information is the outcome of an experiment that was conducted.
- C. The information is the result of an observational study that was conducted.
- D. **The information is the result of a survey that was conducted.**
- E. The information is distributed by an organization or individual.

5. A population has four members (called A, B, C, and D). You would like to select a random sample of $n = 2$, which you decide to do in the following way: Flip a coin; if it is heads, the sample will be items A and B; if it is tails, the sample will be items C and D. Although this is a random sample, it is not a simple random sample. Explain why.

Choose the correct answer below.

- A. **This is not a simple random sample because not every sample of $n = 2$ has the same chance of selection as every other sample of that size.**
- B. This is not a simple random sample because the N items in the frame were not partitioned into n groups of k items.
- C. This is not a simple random sample because not every item has the same chance of selection as every other item.
- D. This is not a simple random sample because the probability of selection for each individual item is unknown.

6. A categorical variable has three categories, with the frequencies of occurrence below.

a. Compute the percentage of values in each category.

b. What conclusions can you reach concerning the categories?

Category	Frequency
A	29
B	12
C	9

a. Complete the table below.

Category	Frequency	Percentage (%)
A	29	<input type="text" value="58"/> %
B	12	<input type="text" value="24"/> %
C	9	<input type="text" value="18"/> %

(Simplify your answers.)

b. What conclusions can you reach concerning the categories?

- A. Category C occurs more than half of the time. The other two categories occur less than half of the time, with category A being the least likely to occur.
- B. **Category A occurs more than half of the time. The other two categories occur less than half of the time, with category C being the least likely to occur.**
- C. Category A is the most likely to occur while category C is the least likely to occur. All three categories occur more than a quarter of the time.
- D. Category A is the most likely to occur while category C is the least likely to occur. All three categories occur less than half of the time.
- E. Category A occurs more than half of the time. The other two categories occur less than half of the time, with category B being the least likely to occur.

7. Form an ordered array, given the following data from a sample of $n = 7$ midterm exam scores in accounting.

73 69 91 99 67 80 74

The ordered array is .

(Use a comma to separate answers as needed.)

8. Construct an ordered array, given the following data from a sample of midterm exam scores in marketing.

86 75 75 74 93 75 87

The ordered array is .

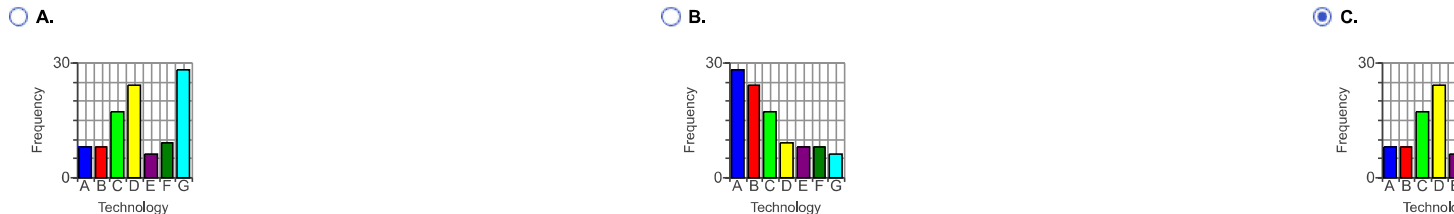
(Use a comma to separate answers as needed.)

9. A 2016 survey of insurance professionals explores the use of technology in the industry. The accompanying data contains the responses to the question that asked what technologies these professionals expected to be most used by the insurance industry in the coming year.

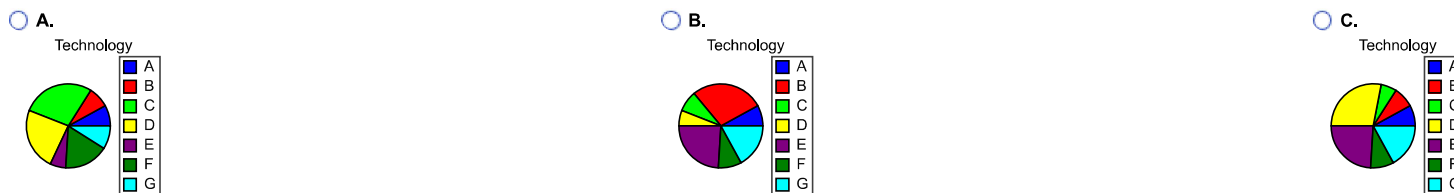
- a. Construct a bar chart and a pie chart.
 b. What conclusions can you reach concerning expected technology usage in the insurance industry?

¹ Click the icon to view the data table.

a. Choose the correct bar chart below.



Choose the correct pie chart below.



b. What conclusions can you reach concerning expected technology usage in the insurance industry? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. Most professionals expect to use Artificial Intelligence, IoT: retail insurance, and Social media. These three account for % of the technologies.
 B. There is no one technology that the professionals expect to use more than any other, since the results are about split evenly between the seven types of technologies.
 C. Most professionals expect to use Wearable technology, Blockchain technology, and IoT: commercial insurance. These three account for % of the needs.

¹: Data Table

Technology	Frequency
A. Wearable technology	8
B. Blockchain technology	8
C. Artificial Intelligence	17
D. IoT: retail insurance	24
E. IoT: commercial insurance	6
F. Social media	28
G. Other	9

10. Construct a stem-and-leaf display, given the following data from a sample of midterm exam scores in finance:

50 61 94 70 94 50 53 84 70

Fill in the stem-and-leaf display below.

5	003
6	1
7	00
8	4
9	44

(Do not use a comma to separate answers.)

11. The following is a set of data from a sample of $n = 5$.

6 9 3 5 10

- a. Compute the mean, median, and mode.
- b. Compute the range, variance, standard deviation, and coefficient of variation.
- c. Compute the Z scores. Are there any outliers?
- d. Describe the shape of the data set.

a. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The mean is .
(Type an integer or a decimal. Do not round. Use a comma to separate answers as needed)
- B. There is no solution.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The median is .
(Type an integer or a decimal. Do not round. Use a comma to separate answers as needed)
- B. There is no solution.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The mode is .
(Type an integer or a decimal. Do not round. Use a comma to separate answers as needed)
- B. There is no solution.

b. The range is . (Type an integer or a decimal. Do not round.)

The variance is .
(Type an integer or decimal rounded to two decimal places as needed.)

The standard deviation is .
(Type an integer or decimal rounded to two decimal places as needed.)

The coefficient of variation is %.
(Type an integer or decimal rounded to two decimal places as needed.)

c. Compute the Z scores.

Data (X)	Z Score	
6	<input type="text" value="-0.21"/>	(Round to two decimal places as needed.)
9	<input type="text" value="0.83"/>	(Round to two decimal places as needed.)
3	<input type="text" value="-1.25"/>	(Round to two decimal places as needed.)
5	<input type="text" value="-0.56"/>	(Round to two decimal places as needed.)
10	<input type="text" value="1.18"/>	(Round to two decimal places as needed.)

Are there any outliers?

- No
- Yes

d. What is the shape of the data set?

- Positive (right-skewed)
- Negative (left-skewed)
- Symmetrical

12. The following set of data is from a sample of $n = 6$.

9 3 8 9 1 12

- Compute the mean, median, and mode.
- Compute the range, variance, standard deviation, and coefficient of variation.
- Compute the Z scores. Are there any outliers?
- Describe the shape of the data set.

a. Compute the mean, median, and mode.

Mean = (Type an integer or decimal rounded to four decimal places as needed.)

Compute the median.

Median = (Type an integer or a decimal. Do not round.)

What is the mode? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The mode(s) is/are .
(Type an integer or a decimal. Do not round. Use a comma to separate answers as needed.)
- B. There is no mode for this data set.

b. Compute the range.

Range = (Type an integer or a decimal. Do not round.)

Compute the variance.

$S^2 =$ (Round to three decimal places as needed.)

Compute the standard deviation.

$S =$ (Round to three decimal places as needed.)

Compute the coefficient of variation.

CV = % (Round to three decimal places as needed.)

c. Compute the Z scores.
(Round to three decimal places as needed.)

Data (X)	Z Score
9	<input type="text" value="0.482"/>
3	<input type="text" value="-0.964"/>
8	<input type="text" value="0.241"/>
9	<input type="text" value="0.482"/>
1	<input type="text" value="-1.447"/>
12	<input type="text" value="1.206"/>

Are there any outliers?

- No
- Yes

d. What is the shape of the data set?

- Symmetric because the mean is equal to the median
- Negative (left-skewed) because the mean is less than the median
- Positive (right-skewed) because the mean is greater than the median
-

13. The following is a set of data from a sample of $n = 7$.

15 11 8 4 1 12 17

(a) Compute the first quartile (Q_1), the third quartile (Q_3), and the interquartile range.

(b) List the five-number summary.

(c) Construct a boxplot and describe the shape.

(a) The first quartile is .

The third quartile is .

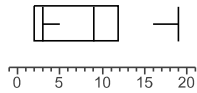
The interquartile range is .

(b) The five-number summary is .

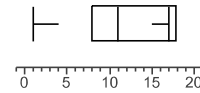
(Use ascending order.)

(c) Which of the following is the correct boxplot?

A.



B.



What is the shape of the data?

Symmetric

Left-skewed

Right-skewed

14. The following set of data is from a sample of $n = 7$.

9 14 8 2 11 14 12

- a. Compute the mean, median, and mode.
- b. Compute the range, variance, standard deviation, and coefficient of variation.
- c. Compute the Z scores. Are there any outliers?
- d. Describe the shape of the data set.

a. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The mean is .
(Type an integer or a decimal. Do not round. Use a comma to separate answers as needed)
- B. There is no solution.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The median is .
(Type an integer or a decimal. Do not round. Use a comma to separate answers as needed)
- B. There is no solution.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The mode is .
(Type an integer or a decimal. Do not round. Use a comma to separate answers as needed)
- B. There is no solution.

b. The range is .
(Type an integer or a decimal. Do not round.)

The variance is .
(Type an integer or decimal rounded to two decimal places as needed.)

The standard deviation is .
(Type an integer or decimal rounded to two decimal places as needed.)

The coefficient of variation is %.
(Type an integer or decimal rounded to two decimal places as needed.)

c. Compute the Z scores.

Data (X)	Z Score	
9	<input type="text" value="-0.24"/>	(Round to two decimal places as needed.)
14	<input type="text" value="0.95"/>	(Round to two decimal places as needed.)
8	<input type="text" value="-0.48"/>	(Round to two decimal places as needed.)
2	<input type="text" value="-1.9"/>	(Round to two decimal places as needed.)
11	<input type="text" value="0.24"/>	(Round to two decimal places as needed.)
14	<input type="text" value="0.95"/>	(Round to two decimal places as needed.)
12	<input type="text" value="0.48"/>	(Round to two decimal places as needed.)

Are there any outliers?

- Yes
- No

d. What is the shape of the data set?

- Positive (right-skewed)
- Negative (left-skewed)
- Symmetrical

15. The following is a set of data from a sample of $n = 5$.

2 -2 -9 2 1

- a. Compute the mean, median, and mode.
- b. Compute the range, variance, standard deviation, and coefficient of variation.
- c. Compute the Z scores. Are there any outliers?
- d. Describe the shape of the data set.

a. The mean is .

(Type an integer or a decimal. Do not round.)

Determine the median.

The median is .

(Type an integer or a decimal. Do not round.)

Determine the mode. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The mode(s) is/are .

(Type an integer or a decimal. Do not round. Use a comma to separate answers as needed.)

B. There is no mode for this data set.

b. The range is . (Type an integer or a decimal. Do not round.)

The variance is .

(Round to two decimal places as needed.)

The standard deviation is .

(Round to two decimal places as needed.)

The coefficient of variation is %.

(Round to two decimal places as needed.)

c. Compute the Z scores.

Data (X)	Z Score
2	<input type="text" value="0.69"/>
-2	<input type="text" value="-0.17"/>
-9	<input type="text" value="-1.67"/>
2	<input type="text" value="0.69"/>
1	<input type="text" value="0.47"/>

(Round to two decimal places as needed.)

Are there any outliers?

No

Yes

d. What is the shape of the data set?

Negative (left-skewed)

Positive (right-skewed)

Symmetrical

16. Four coins are tossed.

- a. Give an example of a simple event.
- b. Give an example of a joint event.
- c. What is the complement of getting a tail on the first coin?
- d. What does the sample space consist of?

a. Give an example of a simple event.

Which of the following is a simple event?

- A. Getting a tail on all coins
- B. Getting a head on the third coin and a tail on the second coin
- C. **Getting a head on the third coin**
- D. Getting a head on no coins

b. Give an example of a joint event.

Which of the following is a joint event?

- A. Getting a head or a tail on the second coin
- B. **Getting a head on the fourth coin and a tail on the second coin**
- C. Not getting a head on the third coin
- D. Not getting a head on the first coin

c. What is the complement of getting a tail on the first coin?

Which of the following is the complement of getting a tail on the first coin?

- A. Getting a head on all coins
- B. Getting a tail on the first coin and a head on all others
- C. Getting a head on the first coin and a tail on all others
- D. **Getting a head on the first coin**

d. What does the sample space consist of?

Which of the following identifies the sample space for the four flipped coins?

- A. Not getting a head on all coins
- B. Getting a tail on any of the coins
- C. Getting a head on one coin and a tail on all others
- D. **Getting a head or a tail on any of the four coins**

17. Use the contingency table to the right to determine the probability of events.

- a. What is the probability of event A?
- b. What is the probability of event A'?
- c. What is the probability of event A and B?
- d. What is the probability of event A or B?

	B	B'
A	40	90
A'	70	10

- a. The probability of event A is .
(Type an integer or decimal rounded to three decimal places as needed.)
- b. The probability of event A' is .
(Type an integer or decimal rounded to three decimal places as needed.)
- c. The probability of event A and B is .
(Type an integer or decimal rounded to three decimal places as needed.)
- d. The probability of event A or B is .
(Type an integer or decimal rounded to three decimal places as needed.)

18. If $P(A) = 0.7$, $P(B) = 0.1$, and A and B are independent, find $P(A \text{ and } B)$.

$P(A \text{ and } B) =$
(Type an integer or a decimal.)

19. In 50 of the 80 years from 1929 through 2008 a certain stock market finished higher after the first week of trading. In 44 of those 50 years, this market finished higher for the year. The following table gives the first-week and annual performance of the market over this 80-year period. Use the table to answer (a) through (c) below.

FIRST WEEK	ANNUAL PERFORMANCE	
	Higher	Lower
Higher	44	6
Lower	15	15

- a. If a year is selected at random, what is the probability that the market finished higher for the year?

0.7375

(Round to four decimal places as needed.)

- b. Given that the market finished higher after the first week of trading, what is the probability that it finished higher for the year?

0.8800

(Round to four decimal places as needed.)

- c. Are the two events "first-week performance" and "annual performance" independent? Explain.

- A. No, the probabilities in (a) and (b) are not equal, which means that one event affects the probability of occurrence of the other event.
- B. Yes, the probabilities in (a) and (b) are equal, which means that neither event affects the probability of occurrence of the other event.
- C. No, the probabilities in (a) and (b) are equal, which means that one event affects the probability of occurrence of the other event.
- D. Yes, the probabilities in (a) and (b) are not equal, which means that neither event affects the probability of occurrence of the other event.

20. For the following, state whether the events created are mutually exclusive and collectively exhaustive.

Students had three choices for responding to a survey about study habits: (i) I do not study, (ii) I study one to three hours each night, and (iii) I study more than three hours each night.

Choose the correct answer below.

- A. The events are both mutually exclusive and collectively exhaustive.
- B. The events are only collectively exhaustive.
- C. The events are neither mutually exclusive nor collectively exhaustive.
- D. The events are only mutually exclusive.

21. Suppose that you and two friends go to a restaurant, which last month filled approximately 95.6% of the orders correctly. Complete parts (a) through (e) below.
² Click the icon to view the order-filling data for two other restaurants.

a. What is the probability that all three orders will be filled correctly?

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

b. What is the probability that none of the three orders will be filled correctly?

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

c. What is the probability that at least two of the three orders will be filled correctly?

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

d. What are the mean and standard deviation of the binomial distribution used in (a) through (c)? Interpret these values.

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

The standard deviation is .
 (Round to four decimal places as needed.)

Interpret the mean and standard deviation.

On average, orders are correctly filled, while there is an approximate variation of from the average number of orders correctly filled.
 (Round to four decimal places as needed.)

e. Compare the results of (a) through (d) with those of the two restaurants given in the popup tables.

Which restaurant has the highest probably of filling orders correctly?

- A. Restaurant C
- B. Restaurant B
- C. The restaurant you and your friends attended
- D. It cannot be determined from the information given.

2: Restaurant Data

Probability of Correct Order at Restaurant B

Data

Sample size 3
Probability of an event of interest 0.899

Parameters

Mean 2.697
Variance 0.2724
Standard Deviation 0.5219

Binomial Probabilities Table

X	P(X)	P(≤X)	P(<X)	P(>X)	P(≥X)
0	0.0010	0.0010	0.0000	0.9990	1.0000
1	0.0275	0.0285	0.0010	0.9715	0.9990
2	0.2449	0.2734	0.0285	0.7266	0.9715
3	0.7266	1.0000	0.2734	0.0000	0.7266

Probability of Correct Order at Restaurant C

Data

Sample size 3
Probability of an event of interest 0.844

Parameters

Mean 2.532
Variance 0.3950
Standard Deviation 0.6285

Binomial Probabilities Table

X	P(X)	P(≤X)	P(<X)	P(>X)	P(≥X)
0	0.0038	0.0038	0.0000	0.9962	1.0000
1	0.0616	0.0654	0.0038	0.9346	0.9962
2	0.3334	0.3988	0.0654	0.6012	0.9346
3	0.6012	1.0000	0.3988	0.0000	0.6012

22. Assume a Poisson distribution.

a. If $\lambda = 2.5$, find $P(X = 10)$.

c. If $\lambda = 0.5$, find $P(X = 3)$.

b. If $\lambda = 8.0$, find $P(X = 9)$.

d. If $\lambda = 3.7$, find $P(X = 5)$.

a. $P(X = 10) =$

(Round to four decimal places as needed.)

b. $P(X = 9) =$

(Round to four decimal places as needed.)

c. $P(X = 3) =$

(Round to four decimal places as needed.)

d. $P(X = 5) =$

(Round to four decimal places as needed.)

23. Assume a Poisson distribution. Find the following probabilities.

a. Let $\lambda = 8.0$, find $P(X \geq 3)$.

b. Let $\lambda = 0.5$, find $P(X \leq 1)$.

c. Let $\lambda = 2.0$, find $P(X \leq 2)$.

d. Let $\lambda = 4.3$, find $P(X \geq 1)$.

e. Let $\lambda = 5.6$, find $P(X \leq 2)$.

a. When $\lambda = 8.0$, $P(X \geq 3) =$

(Round to three decimal places as needed.)

b. When $\lambda = 0.5$, $P(X \leq 1) =$

(Round to three decimal places as needed.)

c. When $\lambda = 2.0$, $P(X \leq 2) =$

(Round to three decimal places as needed.)

d. When $\lambda = 4.3$, $P(X \geq 1) =$

(Round to three decimal places as needed.)

e. When $\lambda = 5.6$, $P(X \leq 2) =$

(Round to three decimal places as needed.)

24. Assume a Poisson distribution with $\lambda = 5.5$. Find the following probabilities.

a. $X = 1$

b. $X < 1$

c. $X > 1$

d. $X \leq 1$

a. $P(X = 1) =$

(Round to four decimal places as needed.)

b. $P(X < 1) =$

(Round to four decimal places as needed.)

c. $P(X > 1) =$

(Round to four decimal places as needed.)

d. $P(X \leq 1) =$

(Round to four decimal places as needed.)

25. What are the properties that must be present in order to use the binomial distribution?

Select all that apply.

- A. Each observation is classified into one of two mutually exclusive and collectively exhaustive categories.
- B. The probability of the event of interest occurring in each observation varies from observation to observation.
- C. The probability of the event of interest occurring in each observation is constant from observation to observation.
- D. The sample consists of a fixed number of successes and failures.
- E. Each observation is classified into one of two mutually exclusive categories.
- F. The value of any observation is depends of the value of the previous observation.
- G. The value of any observation is independent of the value of any other observation.
- H. The sample consists of a fixed number of observations.

26. If $\bar{X} = 103$, $\sigma = 8$, and $n = 60$, construct a 99% confidence interval estimate of the population mean, μ .

$\leq \mu \leq$

(Round to two decimal places as needed.)

27. A paper manufacturer has a production process that operates continuously throughout an entire production shift. The paper is expected to have a mean length of 12 inches, and the standard deviation of the length is 0.03 inch. At periodic intervals, a sample is selected to determine whether the mean paper length is still equal to 12 inches or whether something has gone wrong in the production process to change the length of the paper produced. A random sample of 100 sheets is selected, and the mean paper length is 11.999 inches. A 99% confidence interval estimate for the population mean paper length is $11.99126 \leq \mu \leq 12.00674$. Is it true that you do not know for sure whether the population mean is between 11.99126 and 12.00674 inches? Explain.

Choose the correct answer below.

- A. It is true because the population mean will be in the interval only 1% of the time.
- B. It is true because the population mean will be in the interval only 99% of the time.
- C. It is false because the sample mean falls within the interval.
- D. It is false because the sample mean falls outside the interval.

28. If $n = 300$ and $X = 120$, construct a 99% confidence interval estimate for the population proportion.

$$0.3271 \leq \pi \leq 0.4729$$

(Round to four decimal places as needed.)

29. If you want to be 95% confident of estimating the population proportion to within a sampling error of ± 0.04 , what sample size is needed?

A sample size of is needed.

(Round up to the nearest integer.)

30. When should you use the t distribution to develop the confidence interval estimate for the mean?

Choose the correct answer below.

- A. Use the t distribution when the sample standard deviation S is known.
- B. Use the t distribution when the sample standard deviation S is unknown.
- C. Use the t distribution when the population standard deviation σ is known.
- D. Use the t distribution when the population standard deviation σ is unknown.

31. If you use a 0.05 level of significance in a two-tail hypothesis test, what decision will you make if $Z_{STAT} = -2.39$?

[Click here to view page 1 of the cumulative standardized normal distribution table.](#)³

[Click here to view page 2 of the cumulative standardized normal distribution table.](#)⁴

Determine the decision rule. Select the correct choice below and fill in the answer box(es) within your choice. (Round to two decimal places as needed.)

- A. Reject H_0 if $Z_{STAT} < \text{[]}$ or $Z_{STAT} > \text{[]}$.
- B. Reject H_0 if $Z_{STAT} > \text{[]}$.
- C. Reject H_0 if $Z_{STAT} < -\text{[1.96]}$ or $Z_{STAT} > +\text{[1.96]}$.
- D. Reject H_0 if $Z_{STAT} < -\text{[]}$.

State your conclusion. Choose the correct answer below.

- A. Since Z_{STAT} falls into the rejection region, reject H_0 .
- B. Since Z_{STAT} does not fall into the rejection region, reject H_0 .
- C. Since Z_{STAT} falls into the rejection region, do not reject H_0 .
- D. Since Z_{STAT} does not fall into the rejection region, do not reject H_0 .

3: Cumulative Probabilities for Negative Z-scores

Entry represents area under the cumulative standardized normal distribution from $-\infty$ to Z.

Cumulative Probabilities										
Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
-6.0	0.000000001									
-5.5	0.000000019									
-5.0	0.000000287									
-4.5	0.000003398									
-4.0	0.000031671									
-3.9	0.00005	0.00005	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00003	0.00003
-3.8	0.00007	0.00007	0.00007	0.00006	0.00006	0.00006	0.00006	0.00005	0.00005	0.00005
-3.7	0.00011	0.00010	0.00010	0.00010	0.00009	0.00009	0.00008	0.00008	0.00008	0.00008
-3.6	0.00016	0.00015	0.00015	0.00014	0.00014	0.00013	0.00013	0.00012	0.00012	0.00011
-3.5	0.00023	0.00022	0.00022	0.00021	0.00020	0.00019	0.00019	0.00018	0.00017	0.00017
-3.4	0.00034	0.00032	0.00031	0.00030	0.00029	0.00028	0.00027	0.00026	0.00025	0.00024
-3.3	0.00048	0.00047	0.00045	0.00043	0.00042	0.00040	0.00039	0.00038	0.00036	0.00035
-3.2	0.00069	0.00066	0.00064	0.00062	0.00060	0.00058	0.00056	0.00054	0.00052	0.00050
-3.1	0.00097	0.00094	0.00090	0.00087	0.00084	0.00082	0.00079	0.00076	0.00074	0.00071
-3.0	0.00135	0.00131	0.00126	0.00122	0.00118	0.00114	0.00111	0.00107	0.00103	0.00100
-2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014
-2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019
-2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026
-2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036
-2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048
-2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064
-2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094	0.0091	0.0089	0.0087	0.0084
-2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110
-2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143
-2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183
-1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233
-1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
-1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
-1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
-1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
-1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
-1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
-1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985
-1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
-1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
-0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
-0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
-0.7	0.2420	0.2388	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148
-0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2482	0.2451
-0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
-0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
-0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
-0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
-0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
-0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641
Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09

Entry represents area under the cumulative standardized normal distribution from $-\infty$ to Z.

4: Cumulative Probabilities for Positive Z-scores

Entry represents area under the cumulative standardized normal distribution from $-\infty$ to Z.

Cumulative Probabilities										
Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7518	0.7549
0.7	0.7580	0.7612	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.99865	0.99869	0.99874	0.99878	0.99882	0.99886	0.99889	0.99893	0.99897	0.99900
3.1	0.99903	0.99906	0.99910	0.99913	0.99916	0.99918	0.99921	0.99924	0.99926	0.99929
3.2	0.99931	0.99934	0.99936	0.99938	0.99940	0.99942	0.99944	0.99946	0.99948	0.99950
3.3	0.99952	0.99953	0.99955	0.99957	0.99958	0.99960	0.99961	0.99962	0.99964	0.99965
3.4	0.99966	0.99968	0.99969	0.99970	0.99971	0.99972	0.99973	0.99974	0.99975	0.99976
3.5	0.99977	0.99978	0.99978	0.99979	0.99980	0.99981	0.99981	0.99982	0.99983	0.99983
3.6	0.99984	0.99985	0.99985	0.99986	0.99986	0.99987	0.99987	0.99988	0.99988	0.99989
3.7	0.99989	0.99990	0.99990	0.99990	0.99991	0.99991	0.99992	0.99992	0.99992	0.99992
3.8	0.99993	0.99993	0.99993	0.99994	0.99994	0.99994	0.99994	0.99995	0.99995	0.99995
3.9	0.99995	0.99995	0.99996	0.99996	0.99996	0.99996	0.99996	0.99997	0.99997	0.99997
4.0	0.999968329									
4.5	0.999996602									
5.0	0.999999713									
5.5	0.999999981									
6.0	0.999999999									
Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09

Entry represents area under the cumulative standardized normal distribution from $-\infty$ to Z.

32. If, in a sample of $n = 25$ selected from a normal population, $\bar{X} = 52$ and $S = 20$, what is the value of t_{STAT} if you are testing the null hypothesis $H_0: \mu = 50$?

$t_{STAT} =$

(Type an integer or a decimal.)

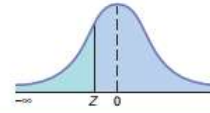
33. In a one-tail hypothesis test where you reject H_0 only in the upper tail, what is the p-value if $Z_{STAT} = +2.90$?

[Click here to view page 1 of the Normal table.](#) [Click here to view page 2 of the Normal table.](#)⁶

The p-value is . (Round to four decimal places as needed.)

5: Area under the cumulative standardized normal distribution from $-\infty$ to Z

The Cumulative Standardized Normal Distribution
Entry represents area under the cumulative standardized normal distribution from $-\infty$ to Z

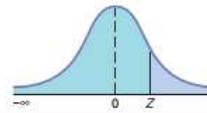


Cumulative Probabilities										
Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
-6.0	0.00000001									
-5.5	0.00000019									
-5.0	0.00000287									
-4.5	0.00003398									
-4.0	0.000031671									
-3.9	0.00005	0.00005	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00003	0.00003
-3.8	0.00007	0.00007	0.00007	0.00006	0.00006	0.00006	0.00006	0.00005	0.00005	0.00005
-3.7	0.00011	0.00010	0.00010	0.00010	0.00009	0.00009	0.00008	0.00008	0.00008	0.00008
-3.6	0.00016	0.00015	0.00015	0.00014	0.00014	0.00013	0.00013	0.00012	0.00012	0.00011
-3.5	0.00023	0.00022	0.00022	0.00021	0.00020	0.00019	0.00019	0.00018	0.00017	0.00017
-3.4	0.00034	0.00032	0.00031	0.00030	0.00029	0.00028	0.00027	0.00026	0.00025	0.00024
-3.3	0.00048	0.00047	0.00045	0.00043	0.00042	0.00040	0.00039	0.00038	0.00036	0.00035
-3.2	0.00069	0.00066	0.00064	0.00062	0.00060	0.00058	0.00056	0.00054	0.00052	0.00050
-3.1	0.00097	0.00094	0.00090	0.00087	0.00084	0.00082	0.00079	0.00076	0.00074	0.00071
-3.0	0.00135	0.00131	0.00126	0.00122	0.00118	0.00114	0.00111	0.00107	0.00103	0.00100
-2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014
-2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019
-2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026
-2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036
-2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048
-2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064
-2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094	0.0091	0.0089	0.0087	0.0084
-2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110
-2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143
-2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183
-1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233
-1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
-1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
-1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
-1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
-1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
-1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
-1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985
-1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
-1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
-0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
-0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
-0.7	0.2420	0.2388	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148
-0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2482	0.2451
-0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
-0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
-0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
-0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
-0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641
Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09

6: Area under the cumulative standardized normal distribution from $-\infty$ to Z

The Cumulative Standardized Normal Distribution (continued)

Entry represents area under the cumulative standardized normal distribution from $-\infty$ to Z



Cumulative Probabilities										
Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7518	0.7549
0.7	0.7580	0.7612	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.99865	0.99869	0.99874	0.99878	0.99882	0.99886	0.99889	0.99893	0.99897	0.99900
3.1	0.99903	0.99906	0.99910	0.99913	0.99916	0.99918	0.99921	0.99924	0.99926	0.99929
3.2	0.99931	0.99934	0.99936	0.99938	0.99940	0.99942	0.99944	0.99946	0.99948	0.99950
3.3	0.99952	0.99953	0.99955	0.99957	0.99958	0.99960	0.99961	0.99962	0.99964	0.99965
3.4	0.99966	0.99968	0.99969	0.99970	0.99971	0.99972	0.99973	0.99974	0.99975	0.99976
3.5	0.99977	0.99978	0.99978	0.99979	0.99980	0.99981	0.99981	0.99982	0.99983	0.99983
3.6	0.99984	0.99985	0.99985	0.99986	0.99986	0.99987	0.99987	0.99988	0.99988	0.99989
3.7	0.99989	0.99990	0.99990	0.99990	0.99991	0.99991	0.99992	0.99992	0.99992	0.99992
3.8	0.99993	0.99993	0.99993	0.99994	0.99994	0.99994	0.99994	0.99995	0.99995	0.99995
3.9	0.99995	0.99995	0.99996	0.99996	0.99996	0.99996	0.99996	0.99996	0.99997	0.99997
4.0	0.999968329									
4.5	0.999996602									
5.0	0.999999713									
5.5	0.999999981									
6.0	0.999999999									
Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09

34. If, in a one-tail hypothesis test where H_0 is only rejected in the upper tail, the p -value = 0.0386 and $Z_{STAT} = +1.77$, what is the statistical decision if the null hypothesis is tested at the 0.04 level of significance?

What is the statistical decision?

Since the p -value is (1) _____ $\alpha =$, (2) _____ H_0 .
(Type an integer or a decimal. Do not round.)

- (1) greater than or equal to (2) **reject**
 less than do not reject

35. If, in a random sample of 250 items, 60 are defective, what is the sample proportion of defective items?

$p =$ (Type an integer or a decimal.)

36. What are the major categories of business analytics?

Select all that apply.

- A. Predictive analytics**
- B. Data mining
- C. Descriptive analytics**
- D. Association methods
- E. Classification methods
- F. Prescriptive analytics**
- G. Clustering methods

37. What is data mining?

Choose the correct answer below.

- A. **Data mining is the use of data sources to help make business decisions.**
- B. Data mining is the application of unsupervised learning methods to business decisions.
- C. Data mining is the application of supervised learning methods to business decisions.
- D. Data mining is the application of artificial intelligence to business decisions.

38. Explain the difference between explanatory and prediction models.

Choose the correct answer below.

- A. Explanatory models are used for independent variables and prediction models are used for dependent variables.
- B. **Explanatory models estimate the general relationships among variables. Prediction models predict variable values for individual cases.**
- C. All models are either explanatory or prediction models depending on how they are used.
- D. Explanatory models estimate the values of variables for individual cases. Prediction models predict the general trends of the variables.

39. What is the purpose of a dashboard in business analytics?

Select all that apply.

- A. **To perform descriptive analytics**
- B. **To monitor data in real time**
- C. **To display graphs and charts**
- D. To perform prescriptive analytics
- E. **To display numerical measures**
- F. To perform predictive analytics
- G. **To display key performance indicators**

40. How do regression trees differ from classification trees?

Choose the correct answer below.

- A. Regression trees are a descriptive model, while classification trees are a predictive model.
- B. Regression trees require numerical independent variables, while classification trees require categorical independent variables.
- C. Regression trees are a predictive model, while classification trees are a descriptive model.
- D. **Regression trees model numerical dependent variables, while classification trees model categorical dependent variables.**