Take Test: Midterm Exam - March 2016

Test Information

Description

QUESTION GROUP		POINTS
A	→	10
B	→	9
C	→	16
D	→	10
E Reg	→	10
E	→	8
F	→	14
G	→	9
H	→	9
I	→	5
TOTAL:		**100**

Instructions	
Timed Test	This test has a time limit of 2 hours.This test will save and submit automatically when the time expires. Warnings appear when **half the time**, **5 minutes**, **1 minute**, and **30 seconds** remain.
Multiple Attempts	Not allowed. This test can only be taken once.
Force Completion	This test can be saved and resumed at any point until time has expired. The timer will continue to run if you leave the test.

Remaining Time: 04 minutes, 48 seconds. Less than five minutes remain.

Question Completion Status:

Saving All Answers | Close Window | Save and Submit

QUESTION 1

0 points Saved

Connect should automatically save each answer. However, **you are responsible for making sure each answer is saved**.
If any answers don't get marked as saved, or don't appear to save properly, inform an invigilator immediately.

Not saved: 2 points Save Answer

Saved: 2 points ✓ Saved

Do you understand this instruction?

Yes... I am responsible for ensuring the questions save properly.

QUESTION 2

1 points Saved

QUESTION GROUP A

When a survey uses responses such as *strongly disagree, disagree, neutral, agree, strongly agree*, what type of data are collected?

(select the best answer)

- ○ Quantitative data
- ○ Binary data
- ○ Time series data
- ◉ Ordinal data
- ○ Nominal data

QUESTION 3 1 points Saved

QUESTION GROUP A

Real estate agencies keep track of housing prices in a given area. Suppose they also provide their clients with quarterly median selling prices for homes in a given area for the past five-year period. These data are:

(select the best answer)

- ◉ Times Series
- ○ Ordinal
- ○ Categorical
- ○ Nominal
- ○ Cross-sectional

QUESTION 4 1 points Saved

QUESTION GROUP A

When a tax auditor randomly selects 20 accounts from all the accounts of a business to check for accuracy, she has selected a...:

(select the best answer)

- ○ Biased sample
- ○ Census
- ○ Stratified sample
- ○ Convenience sample
- ◉ Simple random sample from a population

QUESTION 5 2 points Saved

QUESTION GROUP A

GLOBO is a large Canadian shoe store chain. Sales from their on-line store have been slow compared to their bricks and mortar stores, and management thinks its regular customers are worried about the security of online transactions. Select the sampling design that best describes each of the following ways of choosing a random sample of regular customers.

- Regular customers belong to a rewards program and have a customer rewards ID number. Randomly select 100

numbers.

- Answer: Simple random sample

- GLOBO has stores in five different cities in Ontario, Canada. Randomly select one of the stores and survey all regular customers that belong to its rewards program.
  - Answer: Cluster sample

- GLOBO has an alphabetized list of regular customers who belong to their rewards program. After randomly selecting a customer on the list, every 25th customer from that point on is chosen to be in the sample.
  - Answer: Systematic sample

- Customers are grouped into four age categories (under 21, 21 to 35, 36 to 50, and older than 50). Randomly select 10 regular customers in each age category.
  - Answer: Stratified random sample

QUESTION 6

1 points Saved

QUESTION GROUP A

One member of the management team at GLOBO suggests that the survey could be conducted online. Customers logging on to the online store would be asked to take a few minutes to complete the survey and would be offered a coupon as incentive to participate. Which of the following statements is/are true?

(select ALL correct answers)

- [ ] This would result in an unbiased random sample.
- [x] This would result in a biased sample.
- [x] This is a voluntary response sample.

QUESTION 7

2 points Saved

QUESTION GROUP A

A newspaper article reports that 25% of all Canadian university undergraduates are binge alcohol drinkers. A survey of 500 randomly selected Canadian university undergraduates found that 20% were binge drinkers.

- What is the population size? → None of the above
- What is the sample size? → 500
- What is the parameter? → 25%
- What is the sample statistic? → 20%

QUESTION 8

2 points Saved

QUESTION GROUP A

The Connect Gradebook for COMM 291/BUSI 291 has grades and other information for each registered student. For each variable, choose the description that best describes the type of data the variable represents.

- Student Number → Identifier
- Section Number (e.g. 201, 202, etc.) → Identifier
- Responded to the Student Survey? → Categorical
- Assignment 1 Mark → Quantitative

QUESTION 9 1 points Saved

QUESTION GROUP B

Sailors in the U.S. Navy who went overboard at sea were found to be more likely to be rescued if they were not wearing life jackets than if they were. The explanation was that they wore life jackets in bad weather but not in good weather. In either good weather or bad, they were more likely to be rescued while wearing life jackets, but overall, they were more likely to be rescued while not wearing life jackets. Which concept from class best explains this situation?

(select the best answer)

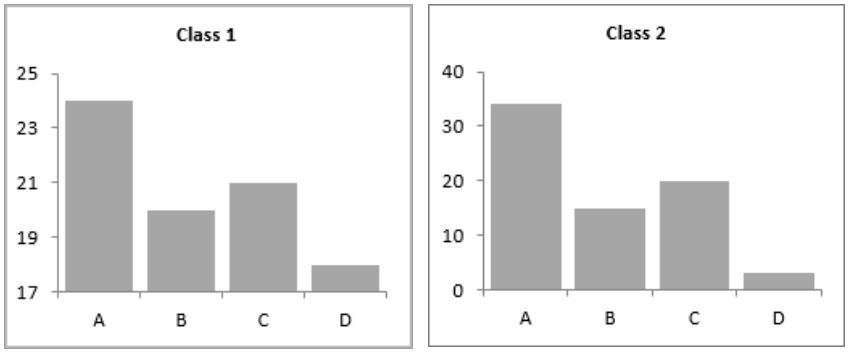
- ○ The Law of Large Numbers
- ◉ Simpson's Paradox
- ○ The Central Limit Theorem
- ○ The Empirical Rule
- ○ Correlation does not imply causation

QUESTION 10 1 points Saved

QUESTION GROUP B

The following two bar charts show the number of students receiving each letter grade for two different classes. Which conclusion about the grades is valid?

(select the best answer)



- ○ Class 2 had more A's and fewer D's than Class 1.
- ○ Class 1 had more B's and C's but approximately the same number of A's and D's as Class 2.
- ◉ The overall grade distribution for the two Classes is approximately equal.
- ○ Class 2 had more B's and C's than Class 1.

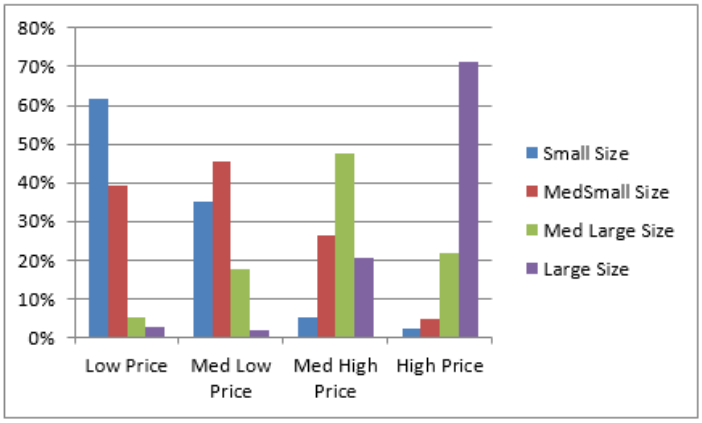
QUESTION 11

1 points Saved

QUESTION GROUP B

The following clustered bar chart shows the percentage of a sample of 1057 houses falling into different *Price* and *Size* categories. What can we say about the association between *Price* and *Size*?

(select the best answer)



- ○ There is definitely a weak negative association.
- ◉ There is a strong association.
- ○ There is no association.
- ○ There is definitely a weak positive association.
- ○ There is likely a weak correlation, but we can't know for sure without calculating *r*.

QUESTION 12

1 points Saved

QUESTION GROUP B

Here is a list of the top ten countries by number of Facebook users in 2015.

Rank	Country	# Facebook Users
1	U.S.A.	170,640,000
2	India	65,635,600
3	Brazil	60,487,400
4	Indonesia	54,435,740
5	Mexico	40,820,750
6	Turkey	34,540,360
7	Philippines	34,467,750
8	United Kingdom	33,657,270
9	Germany	27,735,740
10	France	27,438,580

Which of the following graphs is the most appropriate to display these data?

(select the best answer)

- ○ Time plot
- ○ Histogram
- ○ Segmented bar chart

- (●) Bar chart
- ( ) Pie chart

QUESTION 13 — 5 points — Saved

QUESTION GROUP B

A company started and managed by business students is selling campus calendars. The students have conducted a market survey with various campus constituents to determine the sales potential and identify which market segments should be targeted. The following table shows the results of the market survey.

Counts		Campus Group			
		Students	Faculty/Staff	Alumni	Total
Buying Likelihood	Unlikely	180	119	42	341
	Moderately Likely	369	136	18	523
	Very Likely	351	85	15	451
	Total	900	340	75	1315

Percents		Campus Group		
		Students	Faculty/Staff	Alumni
Buying Likelihood	Unlikely	20.0%	35.0%	56.0%
	Moderately Likely	41.0%	40.00	24.0%
	Very Likely	39.0%	25.0%	20.0%

Fill in the five missing values above, using the exact same format as other cells in the table. Then answer the following questions:

(use 2 decimal places in your percents, do not enter the % sign)

- What percent of respondents are Students?
  - Answer: 68.44 % *(do not enter the % sign)*
- What percent of Student respondents are at least moderately likely (i.e. Moderately Likely or Very Likely) to buy the calendar?
  - Answer: 41.00 % *(do not enter the % sign)*
- What percent of respondents who are Very Likely to buy are Faculty/Staff?
  - Answer: 18.85 % *(do not enter the % sign)*
- What percent of all respondents are Students and Unlikely to buy?
  - Answer: 13.69 % *(do not enter the % sign)*
- Complete this sentence by entering students, faculty/staff or alumni. The market segment that should be targeted first is students.

QUESTION 14 — 1 points — Saved

QUESTION GROUP C

Which choice best completes the following statement?

If the distance from Q1 to the median is larger than the distance from the median to Q3, the distribution is....

(select the best answer)

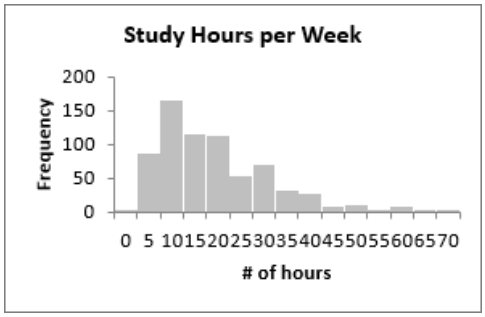
- left-skewed
- symmetric
- right-skewed
- none of the above
- unimodal

QUESTION 15 1 points Saved

QUESTION GROUP C

One question on this year's survey of COMM 291 students asked how many study hours per week they expect to put in. Which of these statements best describes the shape of the distribution shown in the histogram?

(select the best answer)



- Skewed to the right
- Bimodal
- Skewed to the left
- Approximately symmetric

QUESTION 16 1 points Saved

QUESTION GROUP C

Which of the following summary measures cannot be easily approximated from a boxplot?

(select the best answer)

- Standard deviation
- Range
- Interquartile Range
- Median
- 75th percentile

QUESTION 17 1 points Saved

QUESTION GROUP C

A class of 25 students received a mean grade of 72 with a standard deviation of 10. What is the z-score of a student who received a grade of 67?

(select the best answer)

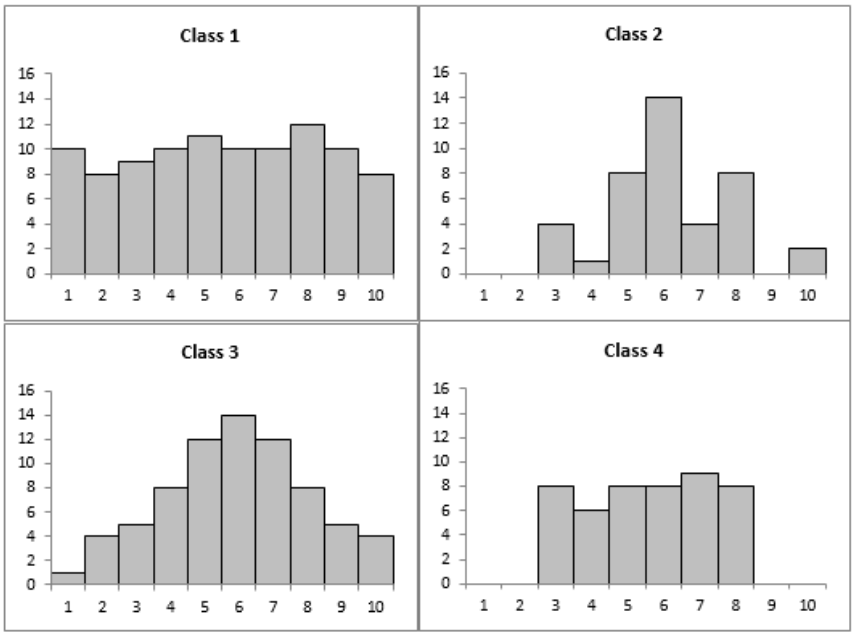
- None of the other answers is correct
- 0.5
- 2.5
- -0.5 ●
- -2.5

QUESTION 18 1 points Saved

QUESTION GROUP C

The following are histograms of quiz scores for four different classes. Which distribution shows the most variability?

(select the best answer)



- Class 4
- Class 2
- Class 1 ●
- Class 3

QUESTION 19 1 points Saved

QUESTION GROUP C

A student scored in the 90th percentile in her Psychology class. Which is always true?

(select the best answer)

- ○ The student's grade will be an A.
- ○ The student earned at least 90% of the total possible points.
- ○ None of the other answers is always true.
- ● The student's grade is at least as high as 90% of their classmates.

QUESTION 20 1 points Saved

QUESTION GROUP C

Edmonton, Alberta, the hometown of your professor, is known for cold winters. Here are the temperatures for the first week of January 2015. Temperatures are in Celsius, and yes, they are all negative!

-3.6, -17.4, -24.4, -26.1, -21.9, -18.8, -13.3, -18.1

By how much could the lowest temperature decrease without changing the median?

(select the best answer)

- ○ It cannot decrease without changing the median.
- ● It can decrease by any amount.
- ○ Decrease by 1.2
- ○ Decrease by 7.3

QUESTION 21 2 points Saved

QUESTION GROUP C

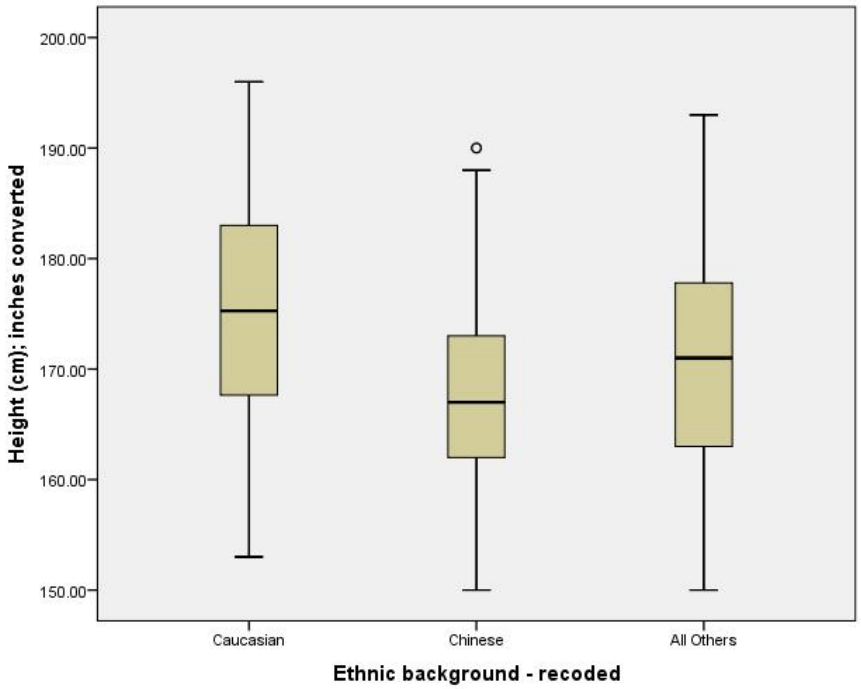
True or False?

- The maximum value of a data set is always considered an outlier.
  - Answer: False
- In a histogram, the proportion of total area to the right of the mean is exactly 0.50 if the distribution is symmetric and unimodal.
  - Answer: True
- A skewed distribution always has a larger standard deviation than a symmetric distribution.
  - Answer: False
- Since the sample is always smaller than the population, the sample mean is always smaller than the population mean.
  - Answer: False

QUESTION 22 3 points Saved

QUESTION GROUP C

Using data from the COMM 291 student survey the following boxplots show heights (in cms) of students classified into three ethnic groups (Caucasian, Chinese, All Others).
Which of the following statement(s) is (are) correct about the distributions of height data for the three groups?



True or False?

- The range of heights is about the same for all three groups.
  - Answer: True
- If the outlier for Chinese were removed the range would remain the same.
  - Answer: False
- The height distributions for Caucasian and All Others have about the same interquartile range.
  - Answer: True
- There is a strong correlation between height and ethnic group, especially between Caucasian and Chinese.
  - Answer: False

QUESTION 23 4 points Saved

QUESTION GROUP C

Continuing with the student study hours question from above, some of the summary statistics have been computed for you.

Mean	SD	Min	Q1	Q3	Max
18.3	12.6	0	9	25	70

Now it's your turn. Fill in the following values:

(do not enter units)

- Is the median closer to 9 or 25 (enter 9 or 25):
  - Answer: 25
- range:
  - Answer: 70

- IQR:
  - Answer: 16
- lower inner fence:
  - Answer: -15
- upper inner fence:
  - Answer: 49
- upper outer fence:
  - Answer: 73
- How many extreme outliers are there (according to the OUTER fence rule):
  - Answer: 0
- To the nearest whole number, what percentage of data values are between 9 and 25?
  - Answer: 50 % *(do not enter the % sign)*

QUESTION 24 1 points Saved

QUESTION GROUP D

A professor gives his students a 10-question True or False quiz, and for each student records the number of questions they got right and the number they got wrong. The correlation coefficient between the number right and the number wrong is:

(select the best answer)

- ○ -0.50
- ○ -1
- ○ 0.50
- ◉ 0
- ○ Cannot tell without the data.
- ○ 1

QUESTION 25 1 points Saved

QUESTION GROUP D

Suppose two mutual funds, Fund A and Fund B, have a perfect negative correlation. Which of the following statements is TRUE?

(select the best answer)

- ○ None of the other answer choices is true.
- ○ If Fund A increases by 20%, Fund B must increase by 20%.
- ◉ If Fund A increases by 20%, Fund B must decrease by 20%.
- ○ If Fund A increases by 20%, Fund B must decrease but the amount may be different from 20%.

QUESTION 26 1 points Saved

QUESTION GROUP D

The correlation between X and Y was computed as 0.50 based on a sample of 25 data points. If the sample size were increased to 100 data points, the correlation would be most likely to:

(select the best answer)

- Decrease
- Cannot tell without the actual data
- Remain the same
- Increase

QUESTION 27 1 points Saved

QUESTION GROUP D

A farmer believes he has increased his wheat production by about the same amount each year. If a linear regression model is fit to the data, the explanatory variable would be:

(select the best answer)

- Land
- Weather
- Rain
- Time
- Wheat

QUESTION 28 1 points Saved

QUESTION GROUP D

A correlation of zero between two quantitative variables means that:

(select the best answer)

- There is no linear association between the two variables.
- There is no association between the two variables.
- We have done something wrong in our calculation of *r*.
- There is a strong association between the two variables.
- Transforming the data will guarantee a linear association between the two variables.

QUESTION 29 1 points Saved

QUESTION GROUP D

When exploring very large sets of data, which of the following is true?

(select the best answer)

- None of the other answer choices.

- Extrapolation is safe because it is based on a greater quantity of evidence.
- A strong association is good evidence for causation because it is based on a large quantity of information.
- Associations will be stronger than would be seen in a much smaller subset of the data.

QUESTION 30 2 points Saved

QUESTION GROUP D

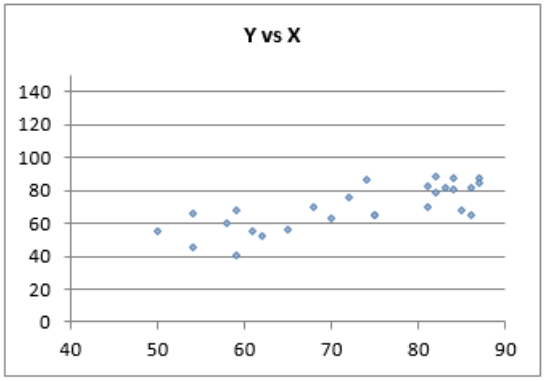
True or False?

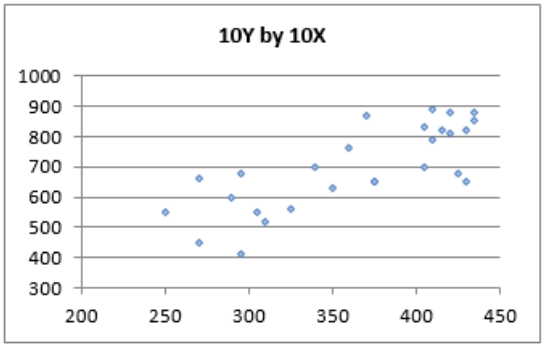
- A correlation of 0 means X and Y are not related at all. False
  - Answer: True
- A correlation of 0.8 means the explanatory variable explains twice as much variation in the response variable as a correlation of 0.4.
  - Answer: False
- An r^2 of 0.64 means the correlation coefficient must be 0.80.
  - Answer: True
- If X and Y are both standardized variables (i.e. mean = 0, SD = 1), the slope of the least squares line equals the correlation coefficient.
  - Answer: False

QUESTION 31 2 points Saved

QUESTION GROUP D

A scatterplot of Y vs. X shows a linear association. Both variables are transformed, by multiplying each variable by 10. Below are scatterplots using the original variables and using the transformed variables.





Compare the first plot to the second plot, and determine whether each of the following statements is true or false?

- The correlation coefficient is the same.
  - Answer: True
- The slope of the regression line is the same.
  - Answer: True
- The intercept of the regression line is the same.
  - Answer: True
- The number of outliers is the same.
  - Answer: True

QUESTION 32

0 points Saved

Remember that **you are responsible for making sure each answer is saved**.
Take a second to look back at your work and make sure everything is saving properly.

Not saved: 2 points Save Answer

Saved: 2 points ✓ Saved

Choose **Yes** to proceed.

- (•) Yes
- ( ) No

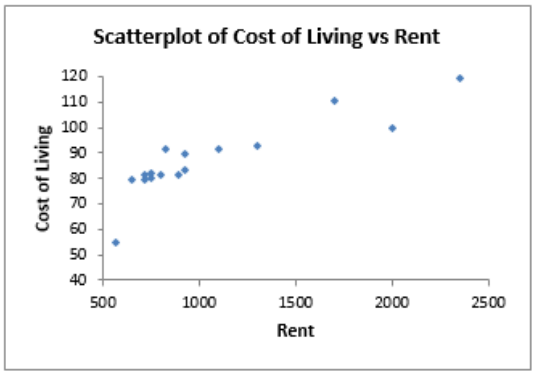
QUESTION 33

2 points Saved

QUESTION GROUP E Reg

The following information is used for the next 6 questions.

Mercer Human Resource Consulting developed an overall cost-of-living index based on hundreds of items to compare costs in selected world cities with costs in New York City. For example, London at 110.6 is 10.6% more expensive than New York. Following is a scatterplot of the 2006 cost-of-living index vs. monthly rent on a luxury apartment, and some summary statistics.



X	Rent ($)	Mean (Rent) = 1060	SD (Rent) = 520
Y	Cost of Living	Mean (Cost of Living) = 87	SD (Cost of Living) = 15
		Correlation = 0.874	

The slope of the estimated regression line that relates the response variable (Cost of Living) to the predictor variable (Rent) is closest to:

Y X

(select the best answer)

- 30.30
- 0.0252
- 10.65
- 0.0717
- None of the other answer choices

QUESTION 34 2 points Saved

QUESTION GROUP E Reg

The intercept of the estimated regression line that relates the response variable (Cost of Living) to the predictor variable (Rent) is closest to:

(select the best answer)

- 11.00
- None of the other answer choices
- -1576.10
- 60.29
- 1957.81

QUESTION 35 1 points Saved

QUESTION GROUP E Reg

R^2

What percent of the variability in the Cost of Living can be explained by Rent?

(select the best answer)

- 76.4%
- 87.4%
- None of the other answer choices
- 30.30%
- 13.6%

QUESTION 36 1 points Saved

QUESTION GROUP E Reg

If another data point (rent = 1500, cost of living = 100) is added to the data set, what will be the most likely effect on the slope of the line?

(select the best answer)

- The slope will increase.
- The slope will stay the same.

- There is not enough information to decide.
- The slope will decrease.

QUESTION 37 — 1 points — Saved

QUESTION GROUP E Reg

What would you predict the cost of living index to be for a city where the monthly luxury apartment rent is $3000?

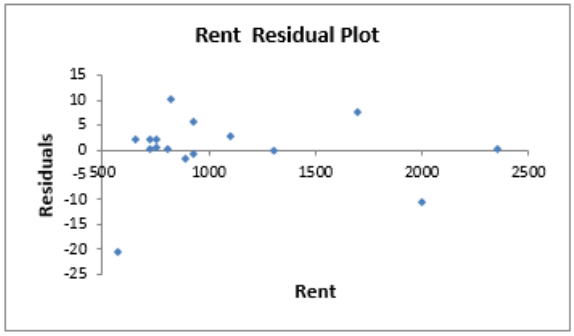
(select the best answer)

- 135.9
- None of the other answer choices
- 87
- 102
- 226.1

QUESTION 38 — 1 points — Saved

QUESTION GROUP E Reg

Here is the residual plot from the previous least squares regression.



What feature(s) are clearly evident in the residual plot?

(select ALL that apply)

- [x] Outlier(s)
- [ ] Curvature
- [x] Unequal spread
- [ ] Influential observations

QUESTION 39 — 2 points — Saved

QUESTION GROUP E Reg

X Y

Another analysis compared the cost of living index to the price of a public transportation ticket (bus, subway), using the same 16 cities.

Public Trans ($)	Mean (Public Trans) = 0.95	SD (Public Trans) = 0.45

Cost of Living	Mean (Cost of Living) = 87	SD (Cost of Living) = 15
	Correlation = Not Given	

A least squares regression equation found that for a city with public transportation cost of 1.95, the estimated cost of living was 111. Use this information to compute the value of the correlation coefficient.

Hint: The regression line passes through $(\bar{x}, \bar{y})$

- Answer: 0.72 *(enter 2 decimal places only)*

QUESTION 40 2 points Saved

QUESTION GROUP E

A regression analysis between the Y-variable, the price of used cars sold at auction (in $1000), and the X-variable, mileage (in thousands) recorded on the odometer, resulted in the following least squares line:

$\hat{y} = 17 - 0.07x$.

(a minus sign is allowed, if applicable)

- This implies that each additional 1000 miles is expected, on average, to result in an increase of $ 70 in price. *(do not enter the $ sign)*
- One data value corresponded to a car with 50,000 miles on the odometer that sold for $13,000. What would the regression equation predict the price to be?
  - Answer: $ 13500 *(give your answer to the nearest dollar, but do not enter the $ sign)*
- What is the residual for the data value in part b?
  - Answer: $ -500 *(give your answer to the nearest dollar, but do not enter the $ sign)*

QUESTION 41 2 points Saved

QUESTION GROUP E

True or False?

- A negative residual means that the model's predicted y-value was higher than the actual y-value.
  - Answer: True
- The best-fitting regression line is the straight line that goes through the highest proportion of data points as possible.
  - Answer: True
- Random scatter in the residuals indicates a model with high predictive power.
  - Answer: True
- Outliers are not a concern when fitting a linear regression model.
  - Answer: False

QUESTION 42 2 points Saved

QUESTION GROUP E

A regression analysis of company profits and the amount of money the company spent on advertising produced an r^2 of 0.72.

True or False?

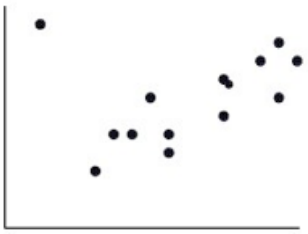
- This model can correctly predict the profit for 72% of companies.
  - Answer: False
- 72% of the variance in company profit can be accounted for by the regression model.
  - Answer: True
- On average, companies spend about 72% of their profits on advertising.
  - Answer: False

QUESTION 43 1 points Saved

QUESTION GROUP E

If the point in the upper left corner of the scatterplot shown below is removed, what will happen to the correlation (r) and the slope of the line of best fit (b_1)?

(select the best answer)



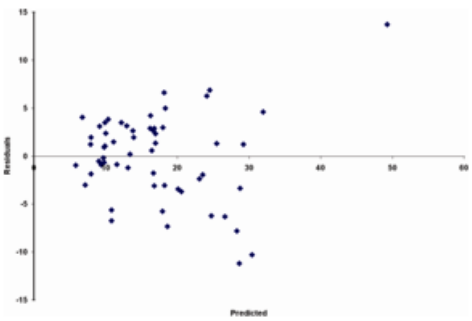
- They will not change
- Both will decrease
- r will increase and b_1 will decrease
- r will decrease and b_1 will increase
- Both will increase

QUESTION 44 1 points Saved

QUESTION GROUP E

Given the following plot of residuals versus fitted values for a regression model, which assumption appears to be violated?

(select the best answer)



- (●) Equal variance
- ( ) Normality
- ( ) Linearity
- ( ) None; all appear to be satisfied
- ( ) Independence

QUESTION 45 — 2 points — Saved

QUESTION GROUP F

To demonstrate the binomial distribution a professor carries out a series of Bernoulli trials, but instead of telling his students the actual number of trials, n, and the probability of success, p, he tells them that the mean is μ = 80 and the standard deviation is σ = 8. Your challenge is to figure out the values of n and p:

- n: 400
- p: 0.2

QUESTION 46 — 2 points — Saved

QUESTION GROUP F

The monthly sales at a retail clothing store have a mean of $70,000 and a standard deviation of $9,000. Profits are calculated by multiplying sales by 30% and subtracting fixed costs of $11,000. Find the mean and standard deviation of monthly profits:

(provide numeric answers with no units or other characters; a minus sign is allowed, if applicable; round to the nearest whole number)

- mean: 10000
- standard deviation: 4928

QUESTION 47 — 5 points — Saved

QUESTION GROUP F

Many hours go into exams, both on the part of instructors and students. Instructors must complete three tasks to create an exam: brainstorming, question-writing, and prooof-reading. Assume the time (in hours) to complete each task is normally distributed, and the tasks are independent:

* brainstorming: μ = 10 and σ = 4
* question-writing: μ = 28 and σ = 4
* proof-reading: μ = 6 and σ = 2

- What is the expected time it takes to complete all three tasks?
  - Answer: 44 *(provide a numeric answer with no units or other characters)*
- What is the standard deviation of the total time?
  - Answer: 6

Assume that the time (in hours) a student studies for an exam is normally distributed with μ = 24 and σ = 8.

- What is the expected amount of additional time that an instructor spends compared to the time a student spends? In other words, what is the expected difference in times?

- Answer: 16

- What is the standard deviation of the difference in times?
  - Answer: 10

- What is the probability that a student spends more time studying for the exam than the instructor spends creating the exam?
  - Answer: 0.06 *(round the probability to 2 decimal places, e.g., if the answer is 0.2468 you would type 0.25)*

QUESTION 48 5 points Saved

QUESTION GROUP F

Americans spend a lot of money on fast food. A study showed that the amount spent per year is over $1200, and that the amount per meal is normally distributed with mean $12.50 per meal and standard deviation $2.50

- What is the probability that a randomly selected meal will cost at least $14.50?
  - Answer: 0.2119 *(round your answer to 4 decimal places, e.g., 0.1234)*

- What is the minimum cost of the most costly 5% of all meals?
  - Answer: $ 16.61 *(do not enter the $ sign; round your answer to 2 decimal places, e.g., xx.12)*

- What proportion of meals are between $12.50 and $14.40?
  - Answer: .2764 *(round your answer to 4 decimal places, e.g., 0.1234)*

- What is the cost at the first quartile?
  - Answer: $ 10.81 *(do not enter the $ sign; round your answer to 2 decimal places, e.g., xx.12)*

Suppose Canadians spend the same mean of $12.50 per meal, but with a different but unknown standard deviation. If we know that the probability of a randomly chosen meal exceeding $14.50 is 0.0548, what is the standard deviation?

- Answer: $ 1.19 *(do not enter the $ sign; round your answer to 2 decimal places, e.g., xx.12)*

QUESTION 49 1 points Save Answer

QUESTION GROUP G

Marks on an exam are normally distributed with mean 72 and standard deviation 12. From a random sample of size n, the standard error of the mean grade is 2.0. What is the value of n?

- Answer:

QUESTION 50 1 points Saved

QUESTION GROUP G

As a general rule the normal distribution is used to approximate the sampling distribution of the sample proportion only if:

(select the best answer)

- ○ np and np(1-p) are both greater than 10.

- (●) The sample size n is greater than 30.
- ( ) The population proportion is close to 0.50.
- ( ) The underlying population is normal.

QUESTION 51 — 1 points — Saved

QUESTION GROUP G

Which of the following is true about the sampling distribution of the sample mean?

(select the best answer)

- (●) The shape of the sampling distribution is always approximately normal.
- ( ) The mean of the sampling distribution is always equal to the population mean (μ).
- ( ) The standard deviation of the sampling distribution is always equal to the population standard deviation (σ).
- ( ) All of the other statements are true.

QUESTION 52 — 1 points — Saved

QUESTION GROUP G

In a very large population, the distribution of annual income is skewed, with a very long right tail. Take a simple random sample of n people from this population and calculate their mean income. The histogram of the n incomes in the sample:

(select the best answer)

- (●) Will look like a Normal distribution if n is large.
- ( ) Will not look like a Normal distribution, regardless of the value of n.
- ( ) Will look like a Normal distribution for all values of n.
- ( ) Will look like a Binomial distribution if n is large.

QUESTION 53 — 1 points — Saved

QUESTION GROUP G

The standard deviation of the mean of a random sample of 100 is 20. In order to cut the standard deviation of the mean to 10, we would:

(select the best answer)

- ( ) Decrease the sample size to 25.
- ( ) Decrease the sample size to 50.
- (●) Increase the sample size to 400.
- ( ) Cut population size in half.
- ( ) Increase the sample size to 200.

QUESTION 54 — 2 points — Saved

QUESTION 54

2 points Saved

QUESTION GROUP G

The number of pizzas consumed per month by university students is normally distributed with a mean of 10 and a standard deviation of 3. What is the probability that in a random sample of 25 students more than 271 pizzas are consumed?

Hint: First compute the mean number of pizzas consumed by the sample of 25 students.

- Answer: 0.0000 *(report your answer to four decimal places, e.g., 0.1234)*

QUESTION 55

2 points Saved

QUESTION GROUP G

From regular surveys of its customers, management of a large restaurant chain claims that 75% of the customers rate the food as excellent. A consumer testing service wants to examine the claim by asking 300 customers to rate the food. What is the probability that less than 70% rate the food as excellent?

- Answer: 0.0228 *(report your answer to four decimal places, e.g., 0.1234)*

QUESTION 56

1 points Saved

QUESTION GROUP H

Use the following information to answer the next 3 questions.

A union composed of several thousand employees is preparing to vote on a new contract. In order for the contract to be accepted, it must receive more than 60% yes votes. A random sample of 600 employees yielded 390 who planned to vote yes. Is there evidence that the contract will be accepted?

The correct null and alternative hypotheses are:

(select the best answer)

- ○ H_0: $p < 0.60$ and H_a: $p = 0.60$
- ○ H_0: $p = 0.60$ and H_a: $p < 0.60$
- ● H_0: $p = 0.60$ and H_a: $p > 0.60$
- ○ H_0: $p = 0.60$ and H_a: $p \neq 0.60$
- ○ H_0: $p > 0.60$ and H_a: $p = 0.60$

QUESTION 57

3 points Saved

QUESTION GROUP H

In order to conduct a hypothesis test at the 0.05 alpha level we need the standard error of $\hat{p}$, the value of the test statistic z, and the critical value z^*. What are these three values?

(provide your answers to three decimal places, e.g., 0.123)

- SE: 0.028
- z: 2.500

- z: 2.500
- z^*: 1.968

QUESTION 58 1 points Saved

QUESTION GROUP H

Instead of using the number you calculated, assume the value of the test statistic is 2.30. At $\alpha = 0.05$:

(select the best answer)

- ○ No conclusion can be reached about the hypothesis with the information that is given.
- ○ We know the contract will certainly receive fewer than 60% yes votes.
- ○ We know the contract will certainly receive more than 60% yes votes.
- ◉ We fail to reject the null hypothesis, because there is not enough evidence to conclude that the contract will receive more than 60% yes votes
- ○ We reject the null hypothesis, and conclude there is enough evidence to say the contract will receive more than 60% yes votes.

QUESTION 59 1 points Saved

QUESTION GROUP H

Suppose the sample size needed to estimate a population proportion to within 0.04 was computed to be 600. To reduce the maximum margin of error to 0.01 (with the same confidence level) the sample size will need to be:

(select the best answer)

- ○ 1200
- ○ 600
- ○ 2400
- ○ 9600
- ◉ 3600

QUESTION 60 1 points Saved

QUESTION GROUP H

It is believed that 15% of the 800 current COMM 291 students take the 99 B-line as part of their commute. In order to conduct a hypothesis test, a random sample of 100 COMM 291 students is selected.

True or False?

- The 10% condition is satisfied, i.e., it does not suggest any problems with the sample size.
  - Answer: True
- The Success/Failure condition is satisfied, i.e., it does not suggest any problems with the sample size.
  - Answer: True

QUESTION 61 2 points Saved

QUESTION GROUP H

Suppose Statistics Canada wants to estimate the percentage of women in the labour force. From a random sample of 525 employment records, they find that 229 of the people are females. The 90% confidence interval is:

(select the best answer)

- 0.4235 to 0.4579
- 0.1243 to 0.7100
- 0.1776 to 0.6944
- 0.2747 to 0.5973
- 0.4006 to 0.4718

QUESTION 62 1 points Saved

QUESTION GROUP I

Use the following information to answer the next 3 questions.

A pizza company advertises that they deliver your pizza within 15 minutes of placing an order or it is free. A sample of 25 customers is selected at random. The mean delivery time in the sample was 13 minutes with a sample standard deviation of 4 minutes. Test whether the advertised claim is supported by the data.

The correct null and alternative hypotheses are:

(select the best answer)

- H_0: $\mu = 15$ and H_a: $\mu < 15$
- H_0: $\mu < 15$ and H_a: $\mu = 15$
- H_0: $\mu > 15$ and H_a: $\mu = 15$
- H_0: $\mu = 15$ and H_a: $\mu > 15$
- H_0: $\mu = 15$ and H_a: $\mu \neq 15$

QUESTION 63 2 points Saved

QUESTION GROUP I

The correct value of the test statistic is:

(select the best answer)

- None of the other answer choices
- 2.50
- -2.50
- 0.50
- -0.50

QUESTION 64 1 points Saved

QUESTION GROUP I

To compute a 95% confidence interval for the mean number of minutes of delivery time, what critical value should you use?

- $t^* =$ 1.487 *(provide your answer to three decimal places, e.g., 0.123)*

QUESTION 65 1 points Saved

LAST QUESTION (FOR A SMILE)

Your instructor taught you the importance of graphing data, so that's what we'll end with. A sample of 500 recently purchased 3D televisions is classified by the company who made them: LG, Samsung, Sony, Toshiba, Other. Would your instructor recommend using a 3D pie chart to graph these data?

(select the best answer)

- ○ Yes, but only if 3D glasses are also provided.
- ◉ No! Never use a 3D pie chart!
- ○ Yes, especially in this case since they are 3D televisions.
- ○ Yes, even though pie charts are round and televisions are rectangular.

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