

1. (1 point) carroll_problib/statistics/lane/Chapter01/basicstatistics.pg

Compute the mean, median, and mode for the following list of numbers.

8	6	13	15	10	9	7	7	11	7	6
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Mean = ____

Median = ____

Mode = ____

Answer(s) submitted:

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(incorrect)

2. (1 point) carroll_problib/statistics/lane/Chapter01/LinearFunction1.pg

The scores of eight students who recently took both the PSAT and SAT exams are listed in the following table.

PSAT	183	207	167	206	197	142	193	176
SAT	2250	2090	1940	2430	2340	2120	2420	2030

Using statistical techniques (which we'll study later), it can be shown that the "line of best fit" for this data set has the formula $y = 4.56x + 1364$, where y represents a student's score on the SAT and x represents the same student's score on the PSAT.

Suppose a new student scores 188 on the PSAT. What does the formula predict their score will be on the SAT? _____

Suppose a different student scores 1840 on the SAT. What does the formula predict their score would be on the PSAT? _____

(Relevant section: **Linear Transformations**)

Answer(s) submitted:

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(incorrect)

3. (1 point) carroll_problib/statistics/lane/Chapter01/MigraineExperiment.pg

A migraine is a particularly painful type of headache, which patients sometimes wish to treat with acupuncture. To determine whether acupuncture relieves migraine pain, researchers conducted a randomized controlled study where 93 females diagnosed with migraine headaches were randomly assigned to one of two groups: treatment or control. 50 patients in the treatment group received acupuncture that is specifically designed to treat migraines. 43 patients in the control group received placebo acupuncture (needle insertion at nonacupoint locations). 24 hours after patients received acupuncture, they were asked if

they were pain free. Results are summarized in the contingency table below.

TABLE OF RESULTS FROM MIGRAINE STUDY

	Pain Free	Not Pain Free	Total
Treatment Group	27	23	___
Control Group	3	40	___
Total	___	___	___

(a) Fill in the missing numbers in the table above.

(b) What percent of patients in the treatment group were pain free 24 hours after receiving acupuncture? ___ %

(c) What percent of patients in the control group were pain free 24 hours after receiving acupuncture? ___ %

(d) Does acupuncture appear to be an effective treatment for migraines?

- A. There is a difference of about 47 % between the treatment and control groups, but it is possible that this difference is due only to chance so acupuncture may not be effective
- B. There is a difference of about 47 % between the treatment and control groups and this is rather large, so acupuncture appears to be an effective treatment.
- C. There is a difference of about 47 % between the treatment and control groups, but the experimental design does not allow us to determine if acupuncture has an effect.
- D. There is a difference of about 47 % between the treatment and control groups so acupuncture appears to be an effective treatment.

Answer(s) submitted:

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(incorrect)

4. (1 point) carroll_problib/statistics/lane/Chapter01/IdentifyResearchQuestions.pg

(a) Researchers collected data to examine the relationship between pollutants and preterm births in Southern California. During the study air pollution levels were measured by air quality monitoring stations. Specifically, levels of carbon monoxide were recorded in parts per million, nitrogen dioxide and

ozone in parts per hundred million, and coarse particulate matter (PM_{10}) in $\mu g/m^3$. Length of gestation data were collected on 143,196 births between the years 1989 and 1993, and air pollution exposure during gestation was calculated for each birth. The analysis suggested that increased ambient PM_{10} and, to a lesser degree, CO concentrations may be associated with the occurrence of preterm births.

What is the research question of interest in this study?

- A. Is there an association between air pollution exposure and preterm births?
- B. Is there an association between levels of carbon monoxide, levels of nitrogen dioxide, and ozone?
- C. There is an association between ambient PM_{10} and the occurrence of preterm births.
- D. There is an association between CO concentrations and the occurrence of preterm births.

(b) In a study of the relationship between socio-economic class and unethical behavior, 129 University of California undergraduates at Berkeley were asked to identify themselves as having low or high social-class by comparing themselves to others with the most (least) money, most (least) education, and most (least) respected jobs. They were also presented with a jar of individually wrapped candies and informed that they were for children in a nearby laboratory, but that they could take some if they wanted. Participants completed unrelated tasks and then reported the number of candies they had taken. It was found that those in the upper-class rank condition took more candy than did those in the lower-rank condition.

What is the research question of interest in this study?

- A. Does social class predict the type of candy people will take?
- B. Does social class predict whether or not a person will take candy?
- C. Does social class predict a person's increased unethical behavior?
- D. Does social class predict the amount that unrelated tasks will distract people from candy?

Answer(s) submitted:

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(incorrect)

5. (1 point) [carroll_problib/statistics/lane/Chapter01/SamplingStrategies.pg](#)

A statistics student at Carroll, who is curious about the relationship between the amount of time Carroll students spend on social media sites and their performance at school, decides to conduct a survey. Consider each of the following research designs.

(A) The student randomly samples 79 students from the populations of 20 randomly chosen colleges, gives them a survey,

asks them to fill it out and return it the next day.

(i) What type of study is this?

- ?
- Convenience Sample
- Sample Survey
- Observational Study
- Controlled Experiment

(ii) Is the study biased?

- ?
- There are no biases.
- The sample does not represent the population of interest.
- The sample size is too small.
- The sample group is too homogeneous.
- The sample was not chosen randomly

(iii) Is this study likely to answer to the student's question? [?/Yes/No]

(B) The student gives out the survey to several college students from around the country who happen to be his Facebook friends and makes sure each one of them fills it out

(i) What type of study is this?

- ?
- Convenience Sample
- Sample Survey
- Observational Study
- Controlled Experiment

(ii) There is a fundamental flaw in this study. What is it?

- ?
- The sample does not represent the population of interest.
- The sample size is too small.
- The sample group is too homogeneous.
- The sample was not chosen randomly.

(iii) Is this study likely to answer to the student's question? [?/Yes/No]

Answer(s) submitted:

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(incorrect)

6. (1 point) [carroll_problib/statistics/lane/Chapter01/percentiles2_tw.pg](#)

A professor gives a test to nine students, and they receive the following scores:

79	65	84	95	48	72	92	86	81
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In statistics, we often call the 25th percentile, "the first quartile" or simply Q_1 . The 50th percentile, or median, is sometimes called, "the second quartile" or Q_2 . The 75th percentile is sometimes called, "the third quartile" or Q_3 . Please find these for the data set above.

$Q_1 =$ _____

$Q_2 =$ _____

$Q_3 =$ _____

Answer(s) submitted:

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(incorrect)

7. (1 point) carroll_problib/statistics/lane/Chapter01/AntibioticTreatment.pg

Researchers studying the effect of antibiotic treatment for acute sinusitis compared to symptomatic treatments randomly assigned 165 adults diagnosed with acute sinusitis to one of two groups: treatment or control. Study participants received either a 10-day course of amoxicillin (an antibiotic) or a placebo similar in appearance and taste. The placebo consisted of symptomatic treatments such as acetaminophen, nasal decongestants, etc. At the end of the 10-day period patients were asked if they experience significant improvement in symptoms. The distribution of responses are summarized below.

(NOTE: All answers below need to be accurate to at least three decimal places.)

TABLE OF RESULTS FROM ANTIBIOTIC STUDY

	Reported Improvement	No Reported Improvement	Total
Treatment Group	55	35	
Control Group	11	64	
Total	_____	_____	

- Fill in the missing numbers in the table above.
- What percent of patients in the treatment group experience a significant improvement in symptoms? ____ %
- What percent of patients in the control group experience a significant improvement in symptoms? ____ %
- Do the data provide convincing evidence that there is a difference in the improvement rates of sinusitis symptoms?

- A. There is a difference of about 46% between the treatment and control groups, but the experimental design does not allow us to determine if antibiotic has an effect.
- B. There is a difference of about 46% between the treatment and control groups so the antibiotic appears to be an effective treatment.
- C. There is a difference of about 46% between the treatment and control groups and this is rather large, so the antibiotic appears to be an effective treatment.

- D. There is a difference of about 46% between the treatment and control groups, but it is possible that this difference is due only to chance so the antibiotic may not be effective.

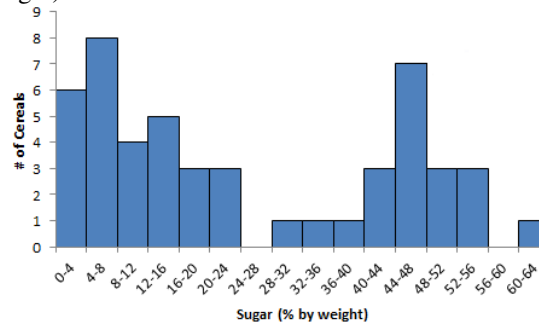
Answer(s) submitted:

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(incorrect)

8. (1 point) carroll_problib/statistics/lane/Chapter02/problem010.pg

The histogram displays the sugar content (as a percent of weight) of 49 brands of breakfast cereals.



How many cereals have between 20 and 32 percent sugar by weight? _____

We expect the median value to fall between ____ and ____.

(Relevant section 1: **Box Plots**)
(Relevant section 2: **Distributions**)

Answer(s) submitted:

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(incorrect)

9. (1 point) carroll_problib/statistics/lane/Chapter03/problem04.pg

Consider the data sets:

A
B
C
3
1
1
3
1
2
4
4
2
7
5
3
9
9
5

Compute the following for each labeled set:

Mean

Median

(Relevant section: **Measures of Central Tendency**)

Answer(s) submitted:

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(incorrect)

10. (1 point) carroll_problib/statistics/lane/Chapter03/proble
m07.pg

Note: For the following questions, there may be more than one correct answer.

15.2	18.8	19.3	19.7	20.2	21.8	22.1	29.4
------	------	------	------	------	------	------	------

You recorded the time in seconds it took for 8 participants to solve a puzzle. These times appear above. However, when the data was entered into the statistical program, the score that was supposed to be 22.1 was entered as 21.2. You had calculated the following measures of variability: the range, the standard deviation, and the variance.

Which of these measures of variability will change when you correct the recording error?

- A. standard deviation
- B. range
- C. variance
- D. None of the above

(Relevant section: **Measures of Variability**)

Answer(s) submitted:

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(incorrect)

11. (1 point) carroll_problib/statistics/lane/Chapter03/proble
m11.pg

An experiment compared the ability of three groups of participants to remember briefly-presented chess positions. The data are shown below. The numbers represent the number of pieces correctly remembered from three chess positions.

Non-players	21.7	22.1	26.7	28.7	32.2	34
Beginners	32.5	37.4	39.5	39.7	44.8	45.7
Tournament Players	40.1	45.7	50.8	57.1	57.2	70.2

Compute the following for each labeled set:

	Non-players	Beginners	Tournament Players
Mean	_____	_____	_____
Median	_____	_____	_____
Range	_____	_____	_____
Variance	_____	_____	_____
Standard Deviation	_____	_____	_____

Give your answer correct to two decimal places.

(Relevant section 1: **Measures of Central Tendency**)

(Relevant section 2: **Additional Measures of Central Tendency**)

(Relevant section 3: **Measures of Variability**)

Answer(s) submitted:

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-
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-
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(incorrect)

12. (1 point) carroll_problib/statistics/lane/Chapter03/proble
m14.pg

When plotted on the same graph, a distribution with a mean of 50 and a standard deviation of 10 will look more spread out than will a distribution with a mean of 60 and a standard deviation of 5.

- A. True
- B. False

(Relevant section: **Measures of Variability**)

Note: you only have one attempt on this problem

Answer(s) submitted:

-

(incorrect)

13. (1 point) carroll_problib/statistics/lane/Chapter03/proble
m13.pg

The following table summarizes the number of students who scored 70 or above for all student scores on an exam is 500 students took the test.

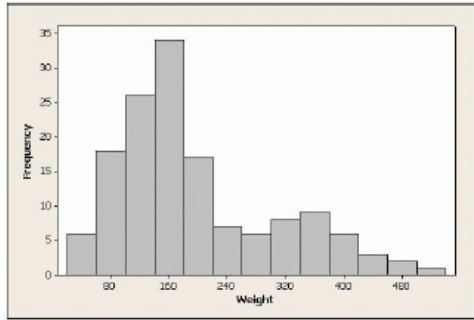
- How many students scored 70 or above? _____
- What was the maximum score? _____
- What was the minimum score? _____
- What was the median score? _____

Answer(s) submitted:

-
-
-
-

(incorrect)

14. (1 point) carroll_problib/statistics/histogram1.pg
The histogram below displays the weights for a certain group of people.



What is the width of the bins in this histogram? ____
The bar centered over 160 includes people whose weights are between ____ and ____ .
Is this distribution symmetric, skewed to the left, or skewed to the right? Enter 1 if symmetric, 2 if skewed to the left, and 3 if skewed to the right. ____

Answer(s) submitted:

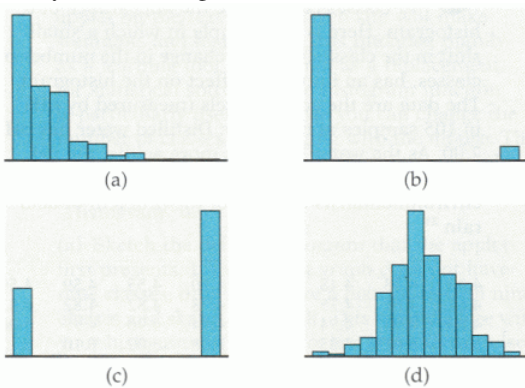
-
-
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(incorrect)

15. (1 point) carroll_problib/statistics/histogram2.pg
A survey of a large college class asked the following questions:

1. Are you female or male? (In the data, male = 0, female = 1.)
2. Are you right-handed or left-handed? (In the data, right = 0, left = 1.)
3. What is your height, in inches?
4. How many minutes do you study on a typical weeknight?

The histograms and bar graphs of the student responses are shown below, in scrambled order and without scale markings. Which histogram goes with each question? Be sure that you can explain your reasoning.



Graph (a) shows the responses to question ____.
Graph (b) shows the responses to question ____.
Graph (c) shows the responses to question ____.
Graph (d) shows the responses to question ____.

Answer(s) submitted:

-
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-
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(incorrect)

16. (1 point) carroll_problib/statistics/types_of_studies/probllem01.pg

Researchers were interested in the effect of pre-existing inappropriate highlighting of text on reading comprehension. They randomly assigned a group of 600 students to two groups. Both groups were asked to answer a reading comprehension test.

The text given to the first group had inappropriate passages highlighted, while the text of the second group wasn't highlighted at all. Then, the researchers compared the average score of each group in the reading comprehension test.

What is the objective of this study?

- A. The researchers want to see if there is a correlation between inappropriate highlighting and student reading comprehension.
- B. The researchers want to estimate the level of reading comprehension in students.
- C. The researchers want to see if inappropriate highlighting causes student reading comprehension to decrease.

Is this study appropriate for the statistical questions it's supposed to answer?

Mark the most suitable choice.

- A. Yes, because they randomized the subjects between the groups and used an appropriate measure for the effect (the test scores).
- B. No, because the type of study they used was inappropriate.
- C. No, because maybe one of the groups has significantly better reading comprehension skills than the other group, regardless of the highlighted text.
- D. No, because they actively interfered with the test of the first group, and therefore affected their test results.

Answer(s) submitted:

-
-

(incorrect)

17. (1 point) carroll_problib/statistics/types_of_studies/probllem02.pg

The taste engineers at 'Drinksoft' have developed a new formula for their major brand 'Cola-Loca.' They wanted to

know how tasty it is to teenagers compared to the old formula, so they decided to set up a blind taste test.

They randomly assigned 300 blindfolded, teenaged participants to two groups. One group was given the old formula of 'Cola-Loca' and the other was given the new formula. Each participant was asked to fill a formal taste 10-point questionnaire, where 1 is considered 'awful' and 10 is considered 'delicious.'

What is the objective of the engineers study?

- A. The engineers want to determine how good the new formula tastes.
- B. The engineers want to determine whether teenagers think the new formula of 'Cola-Loca' is tastier than the old formula.
- C. The engineers want to determine which formula of 'Cola-Loca' teenagers would select.

The engineers found that the average taste score of the new formula is 4 points lower than the average taste score of the old formula.

What valid conclusions can be made from this result?

Mark the most suitable choice.

- A. The result suggests that the old formula tastes better among teenagers than the new one.
- B. There's a positive correlation between drinking the old formula and the perceived tastefulness among teenagers.
- C. The old formula tastes better than the new one.
- D. The result suggests that the old formula tastes better among teenage boys than the new one.

⌏

Answer(s) submitted:

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(incorrect)

18. (1 point) carroll_problib/statistics/types_of_studies/prob

lem03.pg

⌏ A pharmaceutical company wanted to check whether their new cough medicine really relieves coughs.

To do that, they went over medical records of all clinics in the country and looked for an association between the type of medicine prescribed for patients who suffer from coughs and the level of their recovery.

What is the objective of the company's study?

- A. They want to estimate the proportion of patients taking the cough medicine.
- B. They want to determine whether there is a correlation between taking the cough medicine and cough relief.
- C. They want to demonstrate that their cough medicine helps relieve coughs.

Is the study appropriate for the statistical questions it's supposed to answer?

Mark the most suitable choice.

- A. Yes, because the study assesses the connection between taking the cough medicine and cough relief.
- B. No, because the type of study isn't appropriate for the question.
- C. No, because the company didn't choose the clinics at random.
- D. No, because the study collects data of patients who took other medications.

⌏

Answer(s) submitted:

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(incorrect)

19. (1 point) carroll_problib/statistics/types_of_studies/prob

lem04.pg

⌏ Beth wants to go on a popular TV talent show. In order to be accepted, her audition must get at least 60

To make sure she's not going to embarrass herself, she performed her act in front of 100 random people from her school. About 90

What is the objective of Beth's study?

- A. She wants to sample the population to see if there is a correlation between her performance and the audience response.
- B. She wants to estimate a population parameter.
- C. She wants to see if changing her performance leads to a more positive audience response.

Is the study appropriate for the statistical questions it's supposed to answer?

Mark the most suitable choice.

- A. No, because the population she sampled isn't necessarily representative.
- B. Yes, because 90
- C. No, because the sample she used is not big enough.
- D. Yes, because the sample she used is big enough.

⌏

Answer(s) submitted:

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(incorrect)

20. (1 point) carroll_problib/statistics/valid_claims/problem0

1.pg

Note: For the following questions, there may be more than one correct answer.

⌏

The city council of Helena wants to determine whether the residents favor a building plan for the town center. They will ask residents over 21 years of age, 'Do you favor the proposed building plan?'

Which of the following methods of surveying the residents over 21 will allow the city council to make valid conclusions about the preferences of Helena's residents?

Select all that apply.

- A. Put all of the names of residents over 21 into a computer program and allow the program to generate 200 random names. Ask those residents.
- B. Ask every resident over 21 years of age.
- C. Ask all of the residents over 21 who live west of the train tracks
- D. Ask 200 residents over 21 who are shopping at the mall on a particular Saturday.
- E. None of the above

¶ The school board administered a math test to all students in grades 6-8 at Johnsonville Middle School and determined that 15

Based on this data, which of the following conclusions are valid?

Select all that apply.

- A. 15
- B. 15
- C. 15
- D. 15
- E. None of the above

¶ In a survey based on a random sample of 1000 customers, CableCom found that 42

Based on this data, which of the following conclusions are valid?

Select all that apply.

- A. Exactly 42
- B. Exactly 42
- C. Exacty 58
- D. About 42
- E. None of the above

¶

Answer(s) submitted:

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(incorrect)

21. (1 point) [carroll_problib/statistics/valid_claims/problem0](#)

2.pg

Note: For the following questions, there may be more than one correct answer.

¶

An online ad for Dr. Mary Hart, a renowned cardiologist, states, 'in a survey of Dr. Hart's patients, 96

Based on this data, which of the following conclusions are valid?

Select all that apply.

- A. 4
- B. 96
- C. About 96
- D. Exactly 96
- E. None of the above

¶

The school lunch committee at Bayside High wants to determine what types of vegetables to serve in the cafeteria. As part of their survey, they ask all members of the Bayside boy's baseball team the question 'Do you like broccoli?' 15

Based on this data, which of the following conclusions are valid?

Select all that apply.

- A. About 15
- B. Exactly 15 High like broccoli.
- C. 15
- D. 15
- E. None of the above

¶

City Councilwoman Kelly wants to know whether the residents of her district support a proposed school redistricting plan.

Which of the following survey methods will allow Councilwoman Kelly to make a valid conclusion about whether residents of her district support the proposed plan?

Select all that apply.

- A. Ask 200 residents of her district whose names are chosen at random.
- B. Ask her neighbors.
- C. Ask the residents of Shady Acres Retirement Community.
- D. Ask a group of parents at the local playground.
- E. None of the above

¶

Answer(s) submitted:

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(incorrect)

22. (1 point) [carroll_problib/statistics/InterStats/Preliminaries/DescriptiveFromLargeData.pg](#)

The World Health Organization maintains a vast amount of data related to the health and well-being of people, countries, and regions all over the world. The data set linked below contains estimates of the percent of people who smoke in each country in several years. The data was downloaded in 2016 so the data values for 2020 and 2025 are projections for the percent of smokers in the countries.

Start by downloading the data set to your computer and opening it in Excel. For each of the following question you will likely want to use the sort and filter features in Excel.

THE LINK TO THE DATA IS HERE

(a) Find the mean and standard deviation for the percent of smokers in 2000 for the males in Eastern Mediterranean.

mean = _____

Standard Deviation = _____

(b) Find the mean and standard deviation for the percent of

smokers in 2000 for the females in Europe.

mean = _____

Standard Deviation = _____

Answer(s) submitted:

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(incorrect)

23. (1 point) carroll_problib/statistics/InterStats/Immigratio
nViews.pg

915 randomly sampled registered voters from Helena, MT were asked if they through workers who have illegally entered the US should be (i) allowed to keep their jobs and apply for US citizenship, (ii) allowed to keep their jobs as temporary guest workers but not allowed to apply for US citizenship, or (iii) lost their jobs and have to leave the country. The results of the survey by political ideology are shown below.

SURVEY RESULTS BROKEN DOWN BY POLITICAL IDEOLOGY.

	Conservative	Moderate	Liberal
(i) Apply for citizenship	52	129	102
(ii) Guest worker	127	117	29
(iii) Leave the country	175	122	45
Not Sure	10	3	4
Total	364	371	180

(a) What percent of these voters identify themselves as conservatives? _____ %

(b) What percent of these voters are in favor of the citizenship option? _____ %

(c) What percent of these voters identify themselves as conservatives and are in favor of the citizenship option? _____ %

(d) What percent of the voters who identify themselves as conservatives are also in favor of the citizenship option _____ %

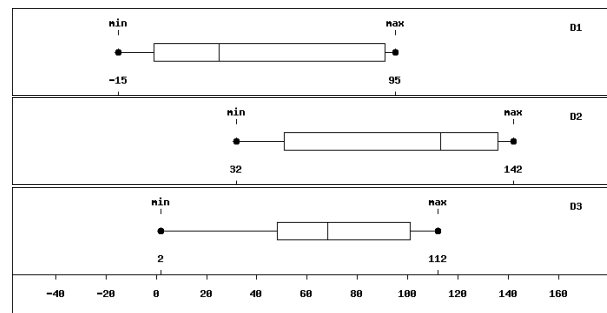
(e) What percent of the voters who identify themselves as moderates are also in favor of the citizenship option _____ %

Answer(s) submitted:

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(incorrect)

24. (1 point) carroll_problib/statistics/dynamic_boxplot.pg



Which of the following are true?

- 283 • A. The data represented in D2 is nearly symmetric.
- 273 • B. All the data values for boxplot D1 are greater than the median value for D2 .
- 342 • C. The data for D1 has a greater median value than the data for D3 .
- 17 • D. At least three quarters of the data values represented in D1 are greater than the median value of D3 .
- 915 • E. At least one quarter of the data values for D3 are less than the median value for D2

Answer(s) submitted:

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(incorrect)