

Statistics Team Questions February Regional

1. Mr. Snow's Statistics class took a test last week. The results form a normal distribution with a mean of 74 and a standard deviation of 6. Use the information to answer the following questions about the class using the appropriate table.

- A: Find the proportion of students scoring greater than 83.
- B: Find the proportion of students scoring less than 62.
- C: Find the proportion of students scoring between 62 and 83.
- D: Find the proportion of students scoring between 56 and 92.

Plug the results into the following expression and round your answer to six decimal

places: $\frac{AB}{CD}$

2. Answer the following questions.

- A: Find the mean of the first ten positive prime numbers.
- B: Find the median of the first ten positive prime numbers.
- C: Find the interquartile range of the first ten positive prime numbers.
- D: Find the range of the first ten positive prime numbers.

Plug the results into the following expression and find the exact solution: $\frac{AD}{BC}$.

3. Suppose that Savannah guesses on each question of a multiple choice quiz.

- A: If each question has four different choices, find the probability that Savannah gets one or more correct answers on a 10 item quiz.
- B: If the quiz consists of three questions, question 1 has 3 possible answers, question two has 4 possible answers, and question 3 has 5 possible answers, find the probability that Savannah gets one or more correct answers.
- C: If the quiz consists of 50 true-false questions, find the probability that Savannah gets 25 or more correct answers.

Plug the results into the following expression and round your answer to six decimal places: ABC .

4. The following scores are the results of the AP Statistics test from Smith High last year

Score	1	2	3	4	5
Probability	.3	.2	.3	.15	.05

The following scores are the results of the AP Calculus test from Smith High last year.

Score	1	2	3	4	5
Probability	.1	.2	.25	.25	.2

- Find the following:
- A: The mean of the AP Statistics scores.
 - B: The standard deviation of the AP Statistics scores.
 - C: The mean of the AP Calculus scores.
 - D: The standard deviation of the AP Calculus scores.

Plug the results into the following expression and round to six decimal places: $\frac{AB}{CD}$.

5. There are 67 seniors at Smith High School. 50 of the seniors take Math, 44 take Science and 38 take English. 35 take Math and Science, 25 take Science and English and 28 take Math and English. 23 take all three courses and all seniors take at least one of the three courses. Find the following.

- A: The number of students who take Math only.
- B: The number of students who take Science only.
- C: The number of students who take English only.

Plug the results into the following expression and find the exact solution: $A+B+C$.

6. A bag of Peanut M+M's is suppose to contain 30% brown, 20% yellow, 20% green, 10% blue, 10% red and 10% tan. A bag of Peanut M+M's purchased by a student contained the following frequencies of each color: 20 brown, 10 yellow, 8 green, 6 blue, 4 red and 2 tan. Calculate the chi-square value associated with a goodness of fit test.

7. Use the following information to answer the questions below: $P(A) = 0.4$, $P(B) = 0.5$. Each question is independent of any other question.

- A: Find $P(A \cup B)$ if A and B are mutually exclusive.
- B: Find $P(A \cup B)$ if A and B are independent.
- C: Find $P(A | B')$ if $P(A \cap B) = 0.2$.
- D: Find $P(B | A')$ if $P(A \cap B) = 0.3$.

Plug the results into the following expression and find the exact solution: $\frac{AD}{BC}$.

8. Smith College has broken down the majors into the following categories:

	Math	Science	History	English
Men	60	80	100	125
Women	70	60	50	75

Assume there are no double majors. Find the following probabilities.

- A: The probability that a student is a Science major, given that the student is a woman?
- B: The probability that a student is a Math major, given that the student is a man?
- C: The probability that the student is a woman, given that the student is a history major?
- D: The probability that the student is a man or an English major?

Plug the results into the following expression and find the exact solution: $\frac{A + C}{B + D}$.

9. The following information is given about two independent sets of data:

$$\bar{x} = 75, S_x = 6, \bar{y} = 130, S_y = 12, r = .80$$

Use the information to find the following:

- A: the slope of the least squares regression line
- B: the value of the x-intercept of the least squares regression line
- C: the value of the y-intercept of the least squares regression line
- D: the predicted value from the least squares regression line when $x = 15$.

Plug the results into the following expression and find the exact value: $A+B+C+D$.

10. The following shows a cumulative frequency chart for the results of a 10 question statistics test.

Score	0	1	2	3	4	5	6	7	8	9	10
Number	3	10	23	38	50	72	90	125	167	188	200

Using this data, find the following:

- A: the mean of the scores
- B: the median of the scores
- C: the mode of the scores
- D: the interquartile range of the scores

Plug the results into the following expression and find the exact value: $(A+B) - (C+D)$.

11. The results of Ms. Tucker's Statistics test are normally distributed. 13.79% of the students scored greater than 82 and 10.38% scored less than 58. Using the appropriate table, find the following:

- A: the mean of the scores
- B: the standard deviation of the scores

Plug the results into the following expression and find the exact value: $\frac{A}{B}$.

12. A large company produces two types of dvd players, a high-end model and a less expensive low-end model. A dvd player is considered defective if it requires repairs within three years of purchase. In a random sample of 300 low-end models, 75 were

considered defective. In a random sample of 125 high-end models, 20 were considered defective. Determine a 95% confidence interval for the difference between the percentage of defective low-end players and the percentage of defective high-end players. Assume the interval is with positive percentages. Round each value of the interval to six decimal places.

13. Determine if the following statements are true or false. If the statement is true, it is worth one point. If the statement is false, it is worth zero points. Find the total number of points with the following statements:

A: The largest value of a set of data can be determined by observing a histogram of the data.

B: The interquartile range is greatly affected by outliers.

C: The mean and median of a normal distribution are equal.

D: A correlation of .95 indicates a cause and effect relationship between the variables.

E: Sample surveys are examples of observational studies.

14. Mrs. Andrade's Statistics class took a test last week. The results of the test were a mean of 68 and a standard deviation of 6. Mrs. Andrade wants to transform the scores so that the mean is 80 and the standard deviation is 5. Find the transformation equation in slope intercept form.

15. Given the following set of data: 2, 4, 8, 15, 26, 35, 42, 48, 55, 59, 68, 78, 80, 99, 5

Find the following:

A= the mean of the data

B= the median of the data

C= the interquartile range of the data

D= the range of the data

Plug the results into the following expression and find the exact solution: $\frac{AC}{BD}$