

Note: For each of the following questions, answer E, NOTA, means "None of the Above."

- Which of the following statements about correlation is false?
 - The correlation coefficient measures how tightly the points on a scatterplot cluster about a straight line.
 - Correlation makes no sense when the variables are measured on a nominal scale.
 - The correlation coefficient is the proportion of the variance of one variable that can be explained by straight-line dependence on the other variable.
 - The correlation coefficient is heavily influenced by outliers.
 - NOTA
- A deck of cards contains 52 cards, of which 4 are aces. You are offered the following wager: Draw one card at random from the deck. You win \$10 if the card drawn is an ace. Otherwise you lose \$1. If you make this wager very many times, what will be the mean outcome? (To the nearest penny.)
 - \$1
 - \$9
 - \$0.15
 - \$0.77
 - NOTA
- A CBS News/New York Times opinion poll asked 1,190 adults whether they would prefer balancing the federal budget over cutting taxes; 702 of those asked said "Yes." Take the sample to be an SRS from the population of all adults. Which of these is a correct 95% confidence interval for the proportion of all adults (correct to 4 decimal places) who prefer balancing the budget to cutting taxes?
 - 0.5899 ± 0.0064
 - 0.5899 ± 0.0140
 - 0.5899 ± 0.0285
 - 0.5899 ± 0.0370
 - NOTA
- A *stratified random sample* is a sample in which
 - every member of the population has the same chance of being selected.
 - the population is first divided into groups of similar individuals, then a separate simple random sample is selected from each group and combined to form the full sample.
 - every possible sample of the same size has the same chance of being selected.
 - the final sample is chosen in several stages, for example, first states, then counties in those states, then households in those counties.
 - NOTA
- How does the margin of error of a 99% confidence interval compare with a 95 % confidence interval if they are both based on the same sample?
 - It would be smaller.
 - It would be the same.
 - It would be larger.
 - Cannot be determined from the given information
 - NOTA

16. A researcher wishes to study how the average weight Y (in kilograms) of children changes during the first year of life. He plots these averages versus the age X (in months) and decides to fit a least-squares regression line to the data with X as the explanatory variable and Y as the response variable. He computes the following quantities:

$$r = 0.9 \quad \bar{x} = 6.5 \quad \bar{y} = 6.6 \quad s_x = 3.6 \quad s_y = 1.2$$

The slope of the least-squares line is

- A. 0.30 B. 0.88 C. 1.01 D. 3.0 E. NOTA
17. If it is known that events A and B are independent and $P(A) = 0.2$ and $P(B) = 0.8$, then
- A. $P(A \text{ and } B) = 0.16$ B. $P(A \text{ or } B) = 1.0$ C. $P(A \text{ and } B) = 1.0$
 D. $P(A \text{ or } B) = 0.16$ E. NOTA
18. If it is known that events A and B are disjoint (mutually exclusive) and $P(A) = 0.2$ and $P(B) = 0.8$, then
- A. $P(A \text{ and } B) = 0.16$ B. $P(A \text{ or } B) = 1.0$ C. $P(A \text{ and } B) = 1.0$
 D. $P(A \text{ or } B) = 0.16$ E. NOTA

Use the following information to answer questions 19 & 20:

A small store keeps track of the number X of customers that make a purchase during the first hour that a store is open each day. Based on the records, X has the following probability distribution.

X	0	1	2	3	4
P(X)	0.1	0.1	0.1	0.1	0.6

19. The mean number of customers that make a purchase during the first hour that the store is open is
- A. 2.0 B. 2.5 C. 3.5 D. 4.0 E. NOTA
20. The standard deviation of the number of customers that make a purchase during the first hour that the store is open is
- A. 1.4 B. 2.0 C. 3.0 D. 4.0 E. NOTA
21. If $P(A) = 0.5$, $P(B) = 0.6$, $P(A \text{ and } B) = 0.1$, then $P(A|B) =$
- A. 0.3 B. 0.2 C. $1/6$ D. Cannot be determined E. NOTA

22. If $P(A) = 0.8$ and $P(B|A) = 0.5$, then $P(A \text{ and } B) =$
- A. 0.3 B. 0.4 C. 0.8 D. Cannot be determined E. NOTA
23. There are twenty multiple-choice questions on an exam, each having responses a, b, c, or d. Each question is worth 5 points and only one option per question is correct. Suppose the student *guesses* the answer to each question, and the guesses from question to question are independent. The probability correct to 4 decimal places that the student gets no questions correct is
- A. 0.0032 B. 0.0243 C. 0.2373 D. 0.3277 E. NOTA
24. Ignoring twins and other multiple births, assume babies born at a hospital are independent events, with the probability that a baby is a boy and the probability that a baby is a girl both equal to 0.5. The probability that at least one of the next three babies is a boy is
- A. 0.125 B. 0.333 C. 0.75 D. 0.875 E. NOTA
25. Three bags contain respectively 2 white and 1 black ball, 3 white and 3 black balls, 6 white and 2 black balls. Two bags are selected and a ball is drawn from each. Find the probability that both balls are white.
- A. 29/72 B. 1/4 C. 19/36 D. 9/34 E. NOTA
26. Three bags contain respectively 2 white and 1 black ball, 3 white and 3 black balls, 6 white and 2 black balls. Two bags are selected and a ball is drawn from each. Find the probability that both balls are of the same color.
- A. 29/72 B. 1/4 C. 19/36 D. 9/34 E. NOTA
27. Jerry, Jack, and Jill work independently to solve a problem. If the respective probabilities that they will solve it are $1/5$, $1/6$, and $1/2$, what is the probability that the problem will be solved?
- A. 13/15 B. 1/60 C. 1/13 D. 1/3 E. NOTA
28. Find the probability that a randomly selected point is located within an equilateral triangle inscribed within a circle of radius 1.
- A. $\frac{2}{3}$ B. $\frac{3\sqrt{3}}{4\pi}$ C. $\frac{3\sqrt{3}}{16\pi}$ D. $\frac{3\sqrt{3}}{\pi}$ E. NOTA

29. Of 320 male and 280 female employees at the home office of the Gibraltar Insurance Company, 160 of the men and 190 of the women are on flextime. Given that an employee selected at random from the group is on flextime, what is the probability correct to 3 decimal places that the employee is a male?
- A. 0.267 B. 0.583 C. 0.76 D. 0.457 E. NOTA
30. Ten students are seated at random in a row. Find the probability that two particular students are not seated side by side.
- A. $\frac{4}{5}$ B. $\frac{9}{10!}$ C. $\frac{9}{10}$ D. $\frac{1}{10}$ E. NOTA