

1. **C.** To find the solution, you must use the formula for conditional probability. So, $\frac{21}{43} = \frac{P(A \cap B')}{P(B')}$. $P(B') = .43$

because it is the complement of B. Therefore, $P(A \cap B') = .21$. Then the intersection of A and B is .30, the value of B

only is .27 and the value of neither A nor B is .22. Using the formula, $P(B|A) = \frac{P(A \cap B)}{P(A)} = \frac{.30}{.51} = \frac{10}{17}$.

2. **D.** Find the factors of 64, which are 1, 2, 4, 8, 16, 32, 64. Find the mean, which is $\frac{127}{7}$. Subtract the mean from each value, square the differences, add the results, and divide by (n-1), or 6 in this problem. Your exact answer is the result.

3. **B.** Find the mean of the distribution, which is 13.25. Subtract the mean from each value, square the differences, multiply the value by its corresponding probability and add them up. This produces the variance, which is 33.8875. The square root of this is the standard deviation, which is the answer to the proper decimal places.

4. **C.** The third statement is false.

5. **E.** The answer is not there because you were not told in the problem that the two events are independent.

6. **B.** The formula for a two sample t confidence interval is $(\bar{x}_1 - \bar{x}_2) \pm t \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$. Using the t chart, for a degree of

freedom of 29, with a 95% confidence gives a t critical value of 2.045. Plugging this in along with the given information produces the following:

$(45 - 34.5) \pm 2.045 \sqrt{\frac{6.25^2}{30} + \frac{4.75^2}{30}} = 10.5 \pm 2.930968501 = (7.56903, 13.43096)$. The answer is obtained

when the interval values are rounded appropriately.

7. **D.** To find the solution, you must do $1 - P(\text{all 3 students get it wrong})$. Therefore, the answer is

$$1 - \left(\frac{2}{5}\right)\left(\frac{5}{12}\right)\left(\frac{2}{3}\right) = 1 - \frac{1}{9} = \frac{8}{9}.$$

8. **A.** The choosing of every nth person is the definition of a systematic sample.

9. **C.** In a distribution skewed to the right, the mean is greater than the median.

10. **D.** To calculate a residual, the formula is observed - predicted. In this case, the observed score is 90 and the predicted score is $3.4(70) - 125 = 113$. Therefore, the residual is $90 - 113 = -23$.

11. **A.** You must set up two equations using the z-score formula and the z-score chart. They are

$$\frac{92 - \text{mean}}{sd} = 1.84 \quad \text{and} \quad \frac{62 - \text{mean}}{sd} = -.02.$$

Solving by elimination gives the exact solution.

12. **E.** When you plug the solution from #11 into one of the original equations and solve for the mean, you get the fraction $\frac{1932}{31}$. Therefore, the answer is E.

13. **D.** The solution is the sum of the four individual binomial distributions of 4, 5, 6, and 7 questions correct out of 10.

14. **D.** The coefficient of determination is r^2 . To find it, you must first find r. To find r, use the formula for slope, which

is $m = r \frac{s_y}{s_x}$. Therefore, when plugging in, you get $\frac{1}{2} = r \frac{5}{3} \Rightarrow r = \frac{3}{10}$. When you square r, you get the solution.

15. **A.** When you plug the data into a calculator, you get 17 for the mean, median and interquartile range. So the quadratic is $17x^2 + 17x - 17 = 0$. Dividing each term by 17 gives you $x^2 + x - 1 = 0$. Using the quadratic formula gives you the solution.

16. **C.** So far in the class, Savannah has earned $90(.20) = 18$ points on the quizzes, $83(.30) = 24.9$ points on the presentations, and $94(.15) = 14.1$ points on the midterm exam. The total of those three components is 57 points. Therefore, she needs 33 points on the final exam. So, $X(.35) = 33$. Solving for X gives you the solution. This is the lowest possible score necessary to maintain a 90% average.

17. **C.** To find the probability, you must compute two z scores. $\frac{100 - 74}{8} = 3.25$ and $\frac{50 - 74}{8} = -3$. Looking up

these z scores in the chart give you values of .0006 and .0013. Since it's an or problem, their sum is the solution.

18. **E.** First, find the mean of the values, which is 63. Subtract the mean from each value, square the differences, and then

divide each difference by 63, and add them up. The total is $\frac{1144}{63}$.

19. **D.** To find the solution, use the two probabilities given. Factor out the $P(X=2)$ to give you $P(X=2)(P(Y=1) + P(Y=2)) = .44$. The $P(Y=1) + P(Y=2) = 1$ because the sum of the probabilities of an event is always 1. Therefore, $P(X=2) = .44$.

Therefore $P(Y=2)$ is equal to $\frac{.28}{.44} = \frac{7}{11}$.

20. **E.** None of the choices must be positive. If a data set consists of the same value, the range and interquartile range would be zero. Standard deviation would also be zero in that situation.

21. **B.** First find the probability of a student going to a football game. That probability is $(.35)(.40) + (.65)(.75) = .6275$.

The probability of the student who goes to games being a male is $\frac{.65(.75)}{.6275} = \frac{195}{251}$.

22. **D.** This is a geometric situation and the standard deviation of a geometric variable is $\sqrt{\frac{1-p}{p^2}}$. When you plug in, you

get $\sqrt{\frac{1-.35}{.35^2}} = \sqrt{\frac{.65}{.1225}} = \sqrt{\frac{260}{49}} = \frac{2\sqrt{65}}{7}$.

23. **B.** To find this probability, first find the probability of getting the same color. Then subtract the three results from

one. The result is $1 - \left(\frac{6}{14}\right)\left(\frac{5}{13}\right) - \left(\frac{5}{14}\right)\left(\frac{4}{13}\right) - \left(\frac{3}{14}\right)\left(\frac{2}{13}\right) = \frac{9}{13}$.

24. **A.** The formula for $P(A \cup B) - P(A \cap B) = P(A) + P(B) - P(A \cap B) - P(A \cap B)$. To find $P(A \cap B) = P(A)P(B)$ because you are told A and B are independent. $P(A \cap B) = .5494$. Therefore, the result is $.67 + .82 - .5494 - .5494 = .3912$.

25. **C.** Because the distribution is skewed to the left, the mean is less than the median because the lower values are dragging the mean down.

26. **C.** First, find the raw score by using the formula $\frac{raw - 350}{\frac{100}{\sqrt{750}}} = 1.645$. You obtain 1.645 by using the z score chart.

Solving for the raw score gives 356.0066907. Plug this value into a new z score with the alternate mean and the same standard deviation. You get $\frac{356.0066907 - 360}{\frac{100}{\sqrt{750}}} = -1.093612788$. Since you are using the chart, the z score you

look up is -1.09. The value is .1379. Since the alternative is greater than, the solution is $1 - .1379 = .8621$.

27. **D.** To find the minimum sample size, use the formula $\frac{z\sigma}{\sqrt{n}} = m$. Plugging the values in that were given and 1.96 for

the z score gives $\frac{1.96(10)}{\sqrt{n}} = 4$. Solving for n gives a value of 24.01, which rounds up to 25.

28. **C.** To find the confidence interval, use the formula $p \pm z\sqrt{\frac{p(1-p)}{n}}$. Using the value of p and n from the problem

along with 2.17 from the z score chart produces the following: $\frac{71}{93} \pm 2.17\sqrt{\frac{\left(\frac{71}{93}\right)\left(1 - \frac{71}{93}\right)}{93}} = \frac{71}{93} \pm .0956259639 = (.6678148963, .8590668241)$.

When you round each value to six decimal places, you get the solution.

29. **E.** A placebo is a control treatment in which members of the control group do not realize whether or not they are receiving the experimental treatment.

30. **A.** To find the new variance, first work with the standard deviation. The standard deviation of the original scores is $5\sqrt{2}$. When the scores are multiplied by 2, so is the standard deviation, making it $10\sqrt{2}$. The subtraction of 56 does not affect the standard deviation. Therefore, the variance of the new scores is $(10\sqrt{2})^2 = 200$.