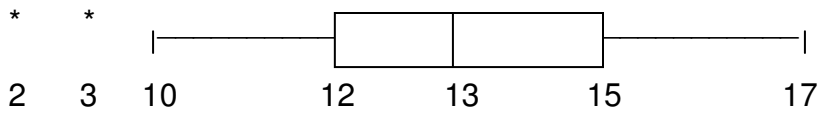
Answer the following questions based on the following box and whisker plot:



A. What is the range of the data set?
B. What is the interquartile range (IQR) of the data set?
C. If X=25th percentile and Y=50th percentile, what is the value of Y-X?
D. If all the values of the data points were increased by 7, what would the new value of the median be?

In her English class, Shelly has grades of 95%, 64% and 80% on quizzes and 85% and 79% on tests.

A. If quizzes and tests are weighted the same, what grade must Shelly get on her next test in order to average an 83% for her tests and quizzes?
B. If tests are weighted twice and quizzes weighted once, what must Shelly get on her next quiz in order to average an 83% for her tests and quizzes?
C. Shelly's teacher tells the class that the lowest quiz grade will be dropped from their overall average. Tests and quizzes are weighted equally. Shelly took her fourth (and final) quiz in the class, which caused her overall average to increase by 2.6%. What grade did Shelly get on the fourth quiz?
D. Shelly's teacher was confused when determining the grades and input each of her totals backwards (if Shelly got a 58% it was input as an 85%). The tests and quizzes are weighted equally. What is the absolute value of the difference between Shelly's true average and the average her teacher got for her?

A. What is the probability of drawing a black card, followed by a red card from a standard 52 card deck without replacement?
B. What is the probability of getting a full house when dealt 5 cards from a standard 52 card deck?
C. What is the probability of getting three of a kind when dealt 5 cards from a standard 52 card deck?
D. What is the probability of getting a flush when dealt 5 cards from a standard 52 card deck (to 4 decimals)?

A. If you throw a dart at a circular target with a 3 inch radius, what is the probability of landing within 1.5 inches of the center, given that you hit the target?
B. A target is made of a square inscribed in a circle which is in turn inscribed in a second square. What is the probability of hitting the target in the small square region, given that you hit the target?
C. Tyler decides to test his luck at a game of chance at a carnival in a game that costs $2 to play. In the game he must break one of 10 balloons with a dart. In the balloons are dollar amounts he receives if he breaks the balloon and all balloons have an equal chance of being popped. Five of the balloons contain $0, two balloons contain $1, two balloons contain $2 and one balloon has $5. What is Tyler's expected game or loss in this game?
D. With regards to the game in part C, the owner of the game wants to change the cost of playing to the "fair price." What is the fair price of playing the game (ie. the price to play the game that makes the expected winnings $0)?

Given that $X \sim N(12,4)$:

A. What is the Z-score associated with a data point of 15?
B. What is the data point that is 1.6 standard deviations below the mean?
C. If $P(9 \le X \le 17) = 0.6678$ and $P(X \le 9) = 0.2266$, what is $P(12 \le X \le 17)$?
D. The 20^{th} percentile is determined by the data point of X. What is the data point that determines the value of the 80^{th} percentile (in terms of X)?

A. Determine the number of distinct arrangements of THEAMAZINGRACE
B. How many ways can a wedding party, composed of a bride, a groom, 3 bridesmaids and 3 ushers be photographed in a line if the bride and groom must be standing next to each other?
C. If ${}_xP_y = \frac{((25!)!)!}{((3!)!)!}$, then what is the value of x-y?
D. What is the sum of all possible values of n if $\frac{1}{4}({}_nP_2)^2 - 27({}_nC_2) - 28 = 0$?

	Earlier Seasons	Later Seasons
Sample average number of times alliance was said	12	7
Sample standard deviation of number of times alliance was said	3	5
Number of episodes	91	91

The table to the right lists certain statistics for a study which looked at amount of times the word alliance was used per episode on various reality TV shows. The table below shows the information based on when the show was aired: earlier seasons compose the shows shown before 2004 and the later seasons compose shows shown during or after 2004. Since there have been well over 1000 reality TV episodes, a sample has been taken. Let μ_E denote the mean number of times it was used during earlier seasons and let μ_L denote the mean number of times it was used during later seasons. (NOTE: For this question, use the following values for special areas under the normal distribution, for all other values use the provided Z-table. Let Z_a be defined so that $P(z>Z_a)=a$, then use the following: $Z_{0.1}= 1.282$, $Z_{0.05} = 1.645$, $Z_{0.025} = 1.96$, $Z_{0.01} = 2.326$)

A. What is the 90% confidence interval for $\mu_E - \mu_L$? (round to 3 decimal places)
B. What is the 95% confidence interval for $\mu_E - \mu_L$? (round to 3 decimal places)
C. If we wish to test H_0: $\mu_E - \mu_L = 0$ vs. H_a: H_0: $\mu_E - \mu_L \neq 0$, what is the value of the test statistic? (round to 3 decimal places)
D. If the p-value for the above test (in part C) is Q, what is the p-value (in terms of Q) of H_0: $\mu_E - \mu_L > 0$ versus H_a: $\mu_E - \mu_L \leq 0$?

For each of the following statements determine if they are true or false. Please write either "TRUE" or "FALSE."

A. The 95% confidence interval for the mean length of ducks (in inches) in a pond is determined to be (4,18). This is interpreted that 95% of the ducks in the pond have a length between 4 and 18 inches.
B. As the number of degrees of freedom, n, for the t-distribution increases towards infinity, the t-distribution approaches the χ^2-distribution.
C. All else being the same, if the sample size quadruples for a 95% confidence interval for a mean, then the size of the interval increases by a factor of 2.
D. $X \sim N(\mu,\sigma)$ and suppose that the Z-score associated with data point a is Z_a, then $P(Z \leq 2Z_a) = 2P(Z \leq Z_a)$.

A. If $f(x) = 3x - 6$, what is the probability that $f(x) \geq -4$ if $x \in [-3,3]$?
B. If $f(x) = x^2 - 4x + 5$, what is the probability that $f(x) \geq 0$ if $x \in [-10,12]$?
C. If $f(x) = x^3 - 4x^2 - x + 2$, what is the probability that $f(x) \geq -2$ if $x \in [-3,5]$?
D. Find the sum of the possible values of a in the following: If $f(x) = x^2 + 3x - 18$, the probability that $f(x) \geq -8$ if $x \in [-7,a]$ is $\frac{3}{10}$.

Suppose a certain disease has a rate of infection of 2%. A certain test for this disease gives a false positive reading 3% of the time. This test also gives a false negative reading 4% of the time.

A. What is the probability that, in a group of 5 people, at most 1 person has the disease? (round to 3 decimals)
B. If a person actually has the disease, what is the probability that the test will give a positive reading for the disease? (round to 3 decimals)
C. If the test reads positive, what is the probability that the person actually does not have the disease? (round to 3 decimals)
D. If the test reads negative, what is the probability that the person actually does have the disease? (round to 3 decimals)

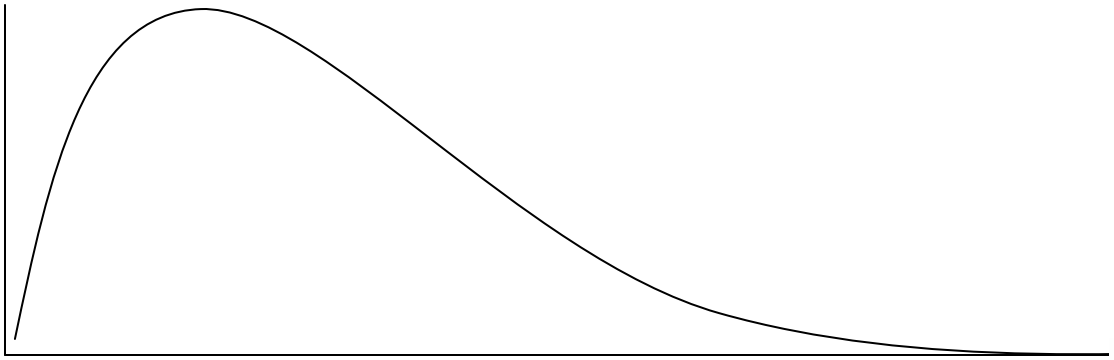
Consider the following data points: (3,6); (5,7); (6,7); (8,8); (10,11); (11,9)

A. Determine the y-intercept of the line of best fit through the above data points (write as a coordinate and round to 2 decimals).
B. Determine the slope of the line of best fit through the above data points (round to 2 decimals).
C. With regards to the above data set, if each x-value was increased by 3 and each y-value was decreased by 7, what is the new value of the y-intercept of the line of best fit (round to 2 decimals)?
D. With regards to the above data set, if each x-value was increased by 3 and each y-value was decreased by 7, what is the new value of the slope of the line of best fit (round to 2 decimals)?

Let q be a real number. Determine the value of q in each of the following that makes each function a probability density function.

A. $f(x) = q,\ -1 \le x \le 5$
B. $g(x) = qx + \frac{1}{6},\ 0 \le x \le 3$
C. $h(x) = \sqrt{q^2 - x^2},\ -q \le x \le q$
D. $k(x) = \sqrt{1 - \frac{x^2}{q^2}},\ -q \le x \le q$

For the following density curve, determine the following:



A. Between the mean, median and mode what value is the smallest?
B. Between the mean, median and mode what value is second largest?
C. Between the mean, median and mode what value is the largest?
D. Which of the following terms best describes the above density curve: skewed left, normal, bimodal, skewed right?

The probability of rain on a given day in Fort Myers, Florida is $\frac{2}{3}$ and the probability of wind on a given day in Fort Myers, Florida is $\frac{3}{5}$. The probability of rain and wind are independent.

A. What is the probability of rain and wind?
B. What is the probability of rain or wind?
C. What is the probability of at least one of rain or wind?
D. What is the probability of, in the next 5 days, it will rain at least 3 days?

Let $\beta = \{4,7,0,3,-3,5,5,5,5,7,3,7,9\}$

A. What is the mean of β?
B. What is the mode of β?
C. What is the interquartile range of β?
D. What is the range of β?