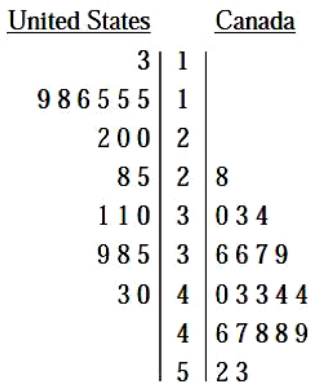1) Sarah is studying about climate in different parts of the world. She has the 365 daily high temperatures for last year from Kabul, Afghanistan. The data are given in units of degrees Celsius (°C). The mean high temperature is 19.3°C and the standard deviation of the high temperature is 9.8°C. Sarah converts each of the 365 temperatures to the Fahrenheit scale by using the formula F= (9/5)C + 32, where F is the temperature in degrees Fahrenheit (°F) and C is the temperature in °C. After making these conversions, what will be the new mean and standard deviation of daily high temperature in units of °F?

A. Mean: 34.7°F, standard deviation: 17.6°F   B. Mean: 34.7°F, standard deviation: 49.6°F

C. Mean: 51.3°F, standard deviation: 9.8°F   D. Mean: 66.7°F, standard deviation: 49.6°F

E. Mean: 66.7°F, standard deviation: 17.6°F

2. The back-to-back stemplot shown below shows the number of compact discs owned by random samples of teenagers who live in the United States and Canada.

United States		Canada
3	1	
9 8 6 5 5 5	1	
2 0 0	2	
8 5	2	8
1 1 0	3	0 3 4
9 8 5	3	6 6 7 9
3 0	4	0 3 3 4 4
	4	6 7 8 8 9
	5	2 3

Which of the following is true of the distributions of the number of CDs owned by teenagers in the two countries?

A. There is more variation in the number of CDs owned by teenagers in the United States than Canada.

B. The mean is larger than the median for both groups.

C. The U.S. group has an outlier and the Canadian group does not.

D. Teenagers in the United States own more CDs overall.

E. The median of the U.S. group is greater than the median of the Canadian group

3. The relative frequency histograms below summarize test scores in two classes, A and B. Which of the following must be true?
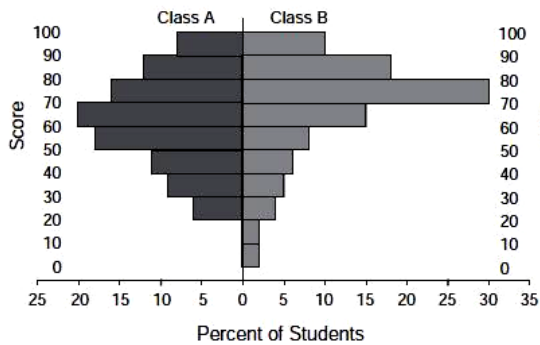
A. There are fewer students in class A than in class.

B. Fewer students scored between 70 and 80 in class A than in class

C. The median of class A is larger than that of class

D. The standard deviation of class A is smaller than that of class

E. Neither class A nor class B contains outliers.

4. A residual graph of a data set is shown. Which of the following statements is correct?
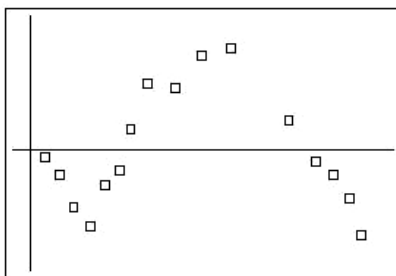
A. The pattern in the residual graph indicates that a linear model is appropriate.

B. The pattern in the residual graph indicates that a nonlinear model is appropriate.

C. The pattern in the residual graph indicates that the model will look exactly like the residual graph.

D. The pattern in the residual graph indicates that there is an error in the data.

E. The pattern in the residual graph indicates that one point is an outlier.

5. Which of the following is the best estimate of the standard deviation for the distribution shown in the diagram below?

$$A.\ 8 \qquad B.\ 15 \qquad C.\ 20 \qquad D.\ 30 \qquad E.\ 50$$
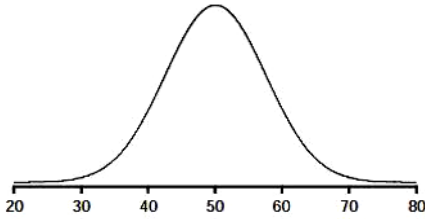
6. A regression model is found for two variables, percent scored on a final exam vs. number of hours studied. The correlation was calculated to be 0.89. Which is the correct interpretation of this value?

    A. For each additional hour studied, the score increased by 0.89 percent.
    B. For each additional percent scored on the test, about one more hour of study is required.
    C. If a linear association exists between the number of hours studied for a final exam and the percent scored on the exam, it is strong.
    D. Eighty-nine percent of the variability in exam scores can be explained by its linear relationship to the number of hours studied.
    E. There is no association between the number of hours studied for a final exam and the percent scored on the exam.

7. A least-squares regression model of Y on X gives a correlation coefficient of 0.75. If the least-squares regression model of X on Y is done, the value of the correlation becomes

    A. -0.75   B. -0.25   C. 0.25   D. 0.66   E. 0.75

8. A dentist found that the coefficient of correlation between the time patients spend brushing their teeth and the whiteness of those teeth is 0.8. This suggests that

A. 80% of people who brush their teeth have white teeth.

B. 80% of the variation in the whiteness of people's teeth can be explained by variation in the time they spend brushing their teeth.
C. 36% of the variation in the whiteness of people's teeth can be explained by variation in the time they spend brushing their teeth.
D. 64% of the variation in the time people spend brushing their teeth can be explained by variation in the degree of whiteness in their teeth.
E. 64% of the variation in the whiteness of people's teeth can be explained by variation in the time they spend brushing their teeth.

9. The least-squares regression equation of the relationship between the sale price (in thousands of dollars) and the size (in square feet) for a randomly selected group of homes in a certain city is y = 0.118x + 42.0, where y = sale price and x = size.

Which of the following statements is the correct interpretation of the slope?

A. For each increase of one square foot in the home size, the price increases on average by $118.

B. For each increase of one square foot in the home size, the price increases on average by $42,000.

C. For each increase of $1,000 in the price of a home, the size increases on average by 0.118 square foot.

D. For each increase of $1,000 in the price of a home, the size increases on average by 42.000 square feet

E. None of the above is a correct interpretation.

10. The least-squares regression equation of the relationship between the sale price (in thousands of dollars) and the size (in square feet) for a randomly selected group of homes in a certain city is y = 0.118x + 42.0, where y = sale price and x = size.

One particular 2,500-square-foot house sold for $300,000. Compute its residual to the nearest thousand dollars.

A. -$337,000   B. -$37,000   C. $0   D. $37,000   E. $337,000

11. The segmented bar graphs shown below summarize a survey of high school students about their favorite genre of novel. Based on the graphs, which of the following statements CANNOT be justified?


Preferences of Novel Genre by Gender
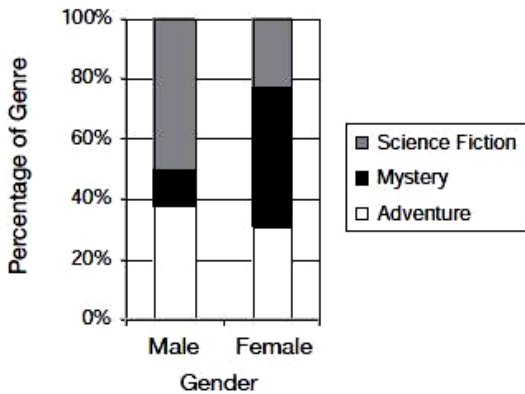
A. For every male surveyed who preferred mystery, about four males preferred adventure.

B. A greater proportion of males surveyed prefer adventure than did females.

C. Females surveyed prefer mystery to either adventure or to science fiction.

D. About half of males surveyed prefer science fiction.

E. Approximately twice as many males as females surveyed prefer science fiction.

12. The owner of a chain of supermarkets notices that there is a positive correlation between monthly sales of sunscreen and monthly sales of ice cream over the course of the previous year. During months when sales of sunscreen were above average, sales of ice cream tended to be above average. Likewise, during seasons with below average sunscreen sales, ice cream sales were usually below average. Which of the following is a valid conclusion from these facts?

A. Using sunscreen makes one hungry for ice cream.   B. Eating ice cream makes one require more sunscreen.

C. A scatterplot of ice cream sales vs. sunscreen sales could look like this:
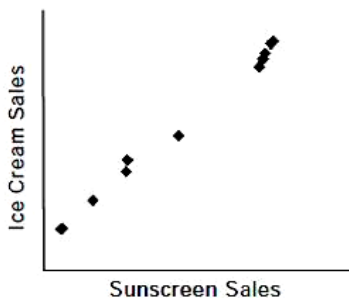
D. Sales records must be in error. There should be no association between sunscreen and ice cream sales.

E. No valid conclusion can be drawn; the sample size is too small.

13. The graph below shows the distribution of retail gasoline prices (per gallon) at randomly selected gas stations around Las Vegas, Nevada, on the first day of June, July, August, and September 2005. Which of the following statements is NOT justified by the boxplots?

Gas Prices   Box Plot ⬍
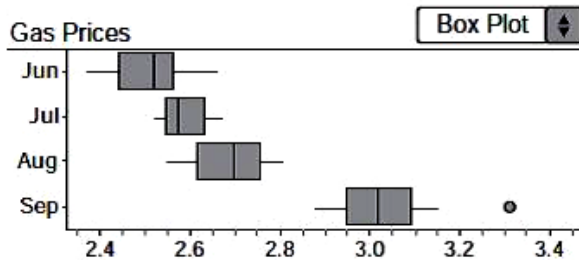
A. The price of gas tended to rise over time.

B. The lowest recorded price on September 1 was greater than the highest recorded price on August 1.

C. Prices wer least variable on July 1.

D. More than half of the recoreded prices in June were above $2.50 per gallon.

E. About twice as many stations were surveyed in June than in July.

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14. The back-to-back stemplots below give the number of points scored last season by two famous basketball players, Harry Hoops and Sam Shooter. Harry and Sam play for the same team and their team played 50 games

Harry Hoops		Sam Shooter
4432211	0	4
9998876666	0	689999
444411110	1	0111222333344444444
87765	1	66666777788999
43311100	2	011222334
855	2	
4211	3	
87	3	5
1	4	
5	4	

stems: tens   leaves: ones

Which of the following statements is NOT true?

A. Harry outscored Sam in more games than Same outscored Harry.
B. Sam and Harry average about the same number of points per game.
C. Sam is the more consistent scorer on the team.
D. Harry's distribution of scores is right-skewed.
E. Sam had once score that could be considered an outlier.

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15. A classmate working on a research project for a statistics class has just reported to you that there is a correlation of –0.79 between gender and income among corporate executives. Which of the following is a correct conclusion that you can draw from your classmate's report?

A. For every dollar of income earned by males, females earn only 79 cents
B. For every dollar of income earned by females, males earn $1.21.
C. Seventy-nine percent of female executives earn less than males doing the same job.
D. Females earn less than males because they work 21% fewer hours than males.
E. Your classmate's report is in error. There can be no correlation between gender and income.

Answers: 1. E, 2. A, 3. D, 4. B, 5. A, 6. C, 7. E, 8. E, 9. A, 10. B, 11. E, 12. C, 13. E, 14. A, 15. E