

1. The ethnicity of the individual respondents in a political poll of a randomly selected group of adults is an example of what type of variable?

- A. Numerical variable
 B. Categorical variable
 C. Neither

ID: 1.2-7

2. The two-way table below shows the survey results when sixty adults were asked whether they had made a clothing purchase in the last thirty days. Of the adult males surveyed, what percentage had made a clothing purchase in the last thirty days?

	Male	Female
Purchased clothing in the last thirty days	10	29
Had not purchased clothing in the last thirty days	10	11

- A. 33%
 B. 50%
 C. 35%
 D. 65%

ID: 1.3-7

- *3. Identify the type of sampling used.

An education researcher randomly selects 65 of the nation's junior colleges and interviews all of the professors at each school.

- convenience
 cluster
 systematic
 stratified
 simple random

ID: 1.4-11

4. Indicate whether the study described is an observational study or a controlled experiment. The smoking rates of teens in urban areas are compared to those living in rural areas to see whether teens living in rural settings have higher rates of smoking.

- Observational study
 Controlled experiment

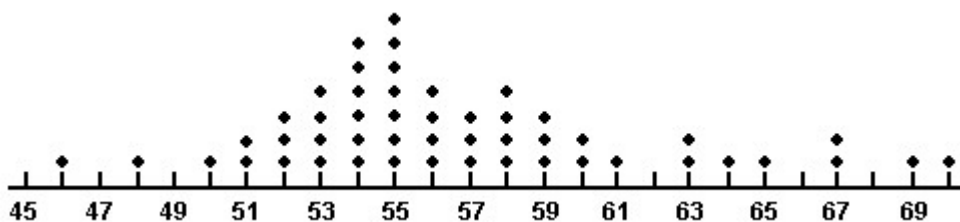
ID: 1.4-3

5. Researchers conducted a study and determined that students who carpool have less friends than students who ride the bus to school. Can we conclude that carpooling causes students to have less friends?

- A. Yes, this is an experiment and we can conclude causation.
- B. No, this is an observational study and we cannot conclude causation.
- C. Yes, this is an observational study and we can conclude causation.
- D. No, this is an experiment and we cannot conclude causation.

ID: 1.4-15

6. A dot plot of the speeds of a sample of 50 cars passing a policeman with a radar gun is shown below. What proportion of the motorists were driving above the posted speed limit of 55 miles per hour?

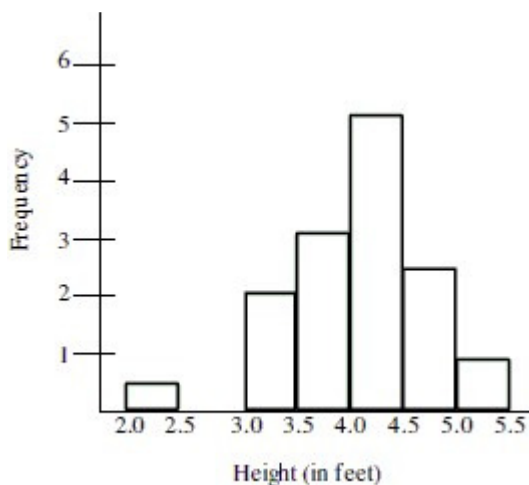


- A. 0.64
- B. 0.14
- C. 7.00
- D. 0.50

ID: 2.1-2-8

7. The histogram to the right is the distribution of heights for a randomly selected Boy Scout troupe. Choose the statement that is true based on information from the histogram.

- A. The smallest value is so extreme that it is possible that a mistake was made in recording the data.
- B. The gap between the two smallest values indicates an outlier may be present.
- C. Although the smallest value does not fit the pattern, it should not be altogether disregarded. It is possible that the Boy Scout is 2.4 feet tall.
- D. All of these are true statements.



ID: 2.1-2-21

8. What are two commonly used graphs to display the distribution of a sample of categorical data?

Choose the correct answer below.

- Bar graph and stemplot
- Bar graph and pie chart
- Dotplots and bar graphs
- Histograms and dotplots

ID: 2.3.RA-1

9. Two Physics classes at Jefferson High School took the same quiz. Mr. Spears had 20 students in his class with a mean score of 80. Mrs. Guyton's class of 30 students had a mean score of 90. Overall, what was the mean score for all students on the quiz?

- A. 86
- B. 85
- C. 87
- D. 84

ID: 3.1-13

10. Find the standard deviation for the given sample data. Round your answer to one more decimal place than is present in the original data.

The numbers listed below represent the amount of precipitation (in inches) last year in six different U.S. cities.

23.4 19.7 48.8 36.6 22 22.6

- A. 4,993.94 in.
- B. 11.47 in.
- C. 5,651.41 in.
- D. 42.70 in.

ID: 3.1-9

11. Below is the standard deviation for extreme 10k finish times for a randomly selected group of women and men. Choose the statement that best summarizes the meaning of the standard deviation.

Women: $s = 0.16$ Men: $s = 0.25$

- A. On average, women's finish times will be 0.16 hours less than men's finish times.
- B. On average, men's finish times will be 0.25 hours faster than the overall average finish time.
- C. The distribution of women's finish times is less varied than the distribution of men's finish times.
- D. The distribution of men's finish times is less varied than the distribution of women's finish times.

ID: 3.1-16

12. Use the following information to answer the question. The mean age of lead actresses from the top ten grossing movies of 2010 was 29.6 years with a standard deviation of 6.35 years. Assume the distribution of the actresses' ages is approximately unimodal and symmetric.

Between what two values would you expect to find about 95% of the lead actresses ages?

- A. 23.25 and 35.95 years
- B. 16.9 and 42.3 years
- C. 10.55 and 48.65 years
- D. None of these

ID: 3.2-1

13. An IQ test has a mean of 105 and a standard deviation of 10. Which is more unusual, an IQ of 85 or an IQ of 132?
-

Select the correct choice below and, if necessary, fill in the answer boxes to complete your choice.

- A. An IQ of 132 is more unusual because its corresponding z-score, _____, is further from 0 than the corresponding z-score of _____ for an IQ of 85.
(Type integers or decimals rounded to two decimal places as needed.)
- B. An IQ of 85 is more unusual because its corresponding z-score, _____, is further from 0 than the corresponding z-score of _____ for an IQ of 132.
(Type integers or decimals rounded to two decimal places as needed.)
- C. Both IQs are equally likely.

ID: 3.2.33

14. Suppose we have a distribution of student exam scores on an easy test. What measure of spread would be best to describe this data?
-

- A. The spread should be described with the IQR because the distribution will be symmetric.
- B. The spread should be described with the IQR because the distribution will be skewed to the left.
- C. The spread should be described with the standard deviation because the distribution will be skewed to the left.
- D. The spread should be described with the standard deviation because the distribution will be symmetric.

ID: 3.3-2

15. Use the side-by-side boxplots below to answer the question. The boxplots summarize the number of sentenced prisoners by state in the Midwest and West. Based on the boxplot for the West, which of the following is true?

¹ Click the icon to view the side-by-side boxplots.

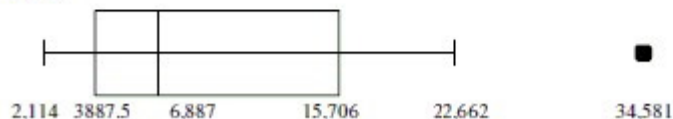
- A. 50% of the states sentenced less than 22,662 prisoners.
- B. 25% of the states sentenced more than 15,706 prisoners.
- C. 25% of the states sentenced less than 3,888 prisoners.
- D. 50% of the states sentenced less than 15,706 prisoners.

1: Side-by-side boxplots of sentences prisoners

Midwest

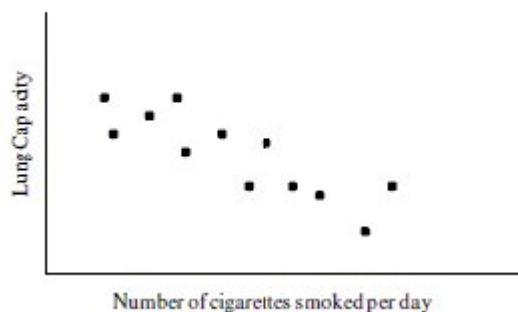


West



ID: 3.5-4

16. Doctors hypothesize that smoking cigarettes inflames the bronchial tubes and so makes it harder to breathe. They measured the lung capacity (in liters) and the number of cigarettes smoked in a typical day for a sample of adults. Is the scatterplot to the right consistent with the researcher's hypothesis?

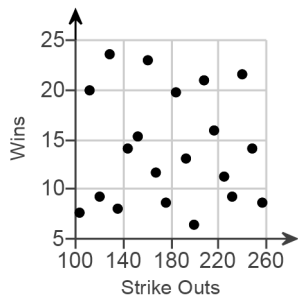


- A. Yes, it is consistent.
- B. No, it contradicts this hypothesis.
- C. There is no evidence in support or contradiction of the hypothesis.

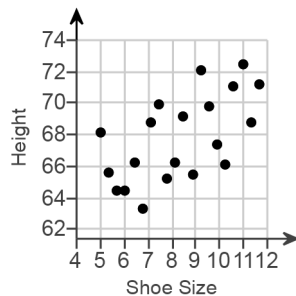
ID: 4.1-6

17. Three scatterplots are shown below. The calculated correlations are -0.05 , 0.61 , and -0.93 . Determine which correlation goes with which scatterplot.

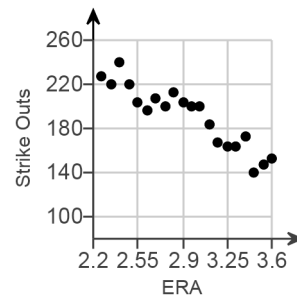
(a)



(b)



(c)



Match each scatterplot with its corresponding correlation.

(a) (1)

(b) (2)

(c) (3)

- | | | |
|-----------------------------------|----------------------------------|-----------------------------------|
| (1) <input type="radio"/> -0.05 | (2) <input type="radio"/> 0.61 | (3) <input type="radio"/> -0.93 |
| <input type="radio"/> -0.93 | <input type="radio"/> -0.05 | <input type="radio"/> -0.05 |
| <input type="radio"/> 0.61 | <input type="radio"/> -0.93 | <input type="radio"/> 0.61 |

ID: 4.2.20

18. A random sample of 30 married couples were asked to report the height of their spouse and the height of their biological parent of the same gender as their spouse. The output of a regression analysis for predicting spouse height from parent height is shown. Assume that the conditions of the linear regression model are satisfied. What is the slope of the regression line? Choose the statement that is the correct interpretation of the slope in context.

² Click the icon to view regression output.

- A. The slope is 48.40. On average, for each inch taller a parent is, the spouse is about 48.40 inches taller, in the sample.
- B. The slope is 0.25. On average, for each 0.25 inches taller a parent is, the spouse is about 1 inch taller, in the sample.
- C. The slope is 0.25. On average, for each inch taller a parent is, the spouse is about 0.25 inches taller, in the sample.
- D. The slope is 48.40. On average, for each inch taller a parent is, the spouse is about 0.25 inches taller, in the sample.

2: Regression output

Regression Analysis: Spouse versus Parent	
The regression equation is spouse = 48.40 + 0.25 parent	
<i>Predictor: Constant</i>	<i>Predictor: Parent</i>
Parameter Estimate: 48.398	Parameter Estimate: 0.247
Standard Error: 39.695	Standard Error: 0.566
T-statistic: 1.219	T-statistic: 0.437
p-value: 0.277	p-value: 0.680
S=7.794899045 R-sq=0.036858791 r=0.1919864344	

ID: 4.3-9

19. The accompanying scatterplot shows the relationship between a car's speed and the distance it traveled to come to a complete stop when hitting the brakes. The correlation coefficient between the values is 0.81.

³ Click the icon to view the scatterplot.

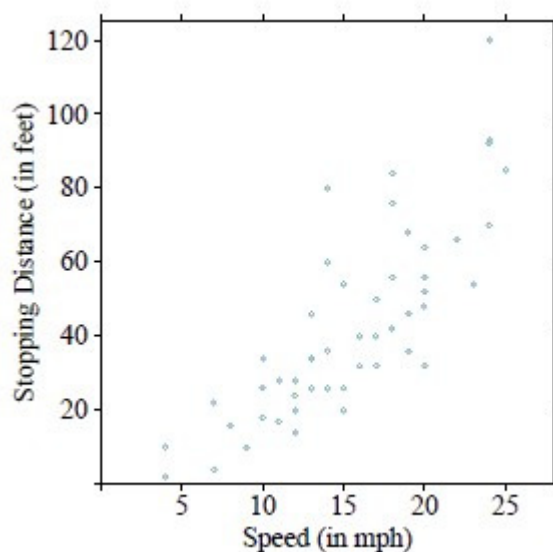
The regression equation for the data is

$$\widehat{\text{Distance}} = -17.579 + 3.932 \cdot (\text{Speed})$$

Can we use the regression equation to predict the stopping distance of a car that is traveling at 40 mph?

- A. No, we cannot make a prediction because a car that is traveling at 40 mph is outside the range of our data. We would be extrapolating.
- B. No, we cannot make a prediction because the correlation coefficient does not equal 1.
- C. Yes, we can make a prediction because the scatterplot shows a strong positive linear relationship.
- D. Yes, we can always make predictions once we have a regression equation.

3: Scatterplot



ID: 4.4-15

20. The sample space given here shows all possible sequences for a family with 4 children, where B stands for boy and G stands for girl. If all 16 outcomes are equally likely, find the probability that there are:

GGGG GGGB GGGB GBBB BBBB
 GGBG GBGB BGBB
 GBGG GBBG BBGB
 BGGG BGGB BBBG
 BGBG
 BBGG

- exactly 0 girls.
- exactly 1 boy.
- exactly 2 boys.
- exactly 3 boys.
- exactly 4 boys.

- The probability of exactly 0 girls is . (Type an integer or a simplified fraction.)
- The probability of exactly 1 boy is . (Type an integer or a simplified fraction.)
- The probability of exactly 2 boys is . (Type an integer or a simplified fraction.)
- The probability of exactly 3 boys is . (Type an integer or a simplified fraction.)
- The probability of exactly 4 boys is . (Type an integer or a simplified fraction.)

ID: 5.2.15

21. Use the following table to answer the question. A random sample of college students was asked to respond to a survey about how they spend their free time on weekends. One question, summarized in the table below, asked each respondent to choose the one activity that they are most likely to participate in on a Saturday morning. The activity choices were homework, housework, outside employment, recreation, or other.

	Homework	Housework	Outside Employment	Recreation	Other	Total
Male	29	15	20	23	9	96
Female	18	17	26	39	4	104
Total	47	32	46	62	13	200

If one student is randomly chosen from the group, what is the probability that the student chose "homework" or "housework" as their most likely activity on a Saturday morning?

- A. 0.395
- B. 0.075
- C. 0.145
- D. None of these

ID: 5.2-8

22. The table below describes the smoking habits of a group of asthma sufferers.

	Nonsmoker	Light smoker	Heavy smoker	Total
Men	307	71	68	446
Women	356	86	67	509
Total	663	157	135	955

If one of the 955 subjects is randomly selected, find the probability that the person chosen is a nonsmoker given that the person is a woman. Round to three decimal places.

- A. 0.373
- B. 0.537
- C. 0.699
- D. 0.533

ID: 5.3-3

23. Suppose that a recent poll of American households about car ownership found that for households with a car, 39% owned a sedan, 33% owned a van, and 7% owned a sports car. Suppose that three households are selected randomly and with replacement.

What is the probability that none of the three randomly selected households own a van? (Round to the nearest thousandth)

- A. 0.060
- B. 0.301
- C. 0.036
- D. 0.699

ID: 5.3-9

24. Determine whether the variable would best be modeled as continuous or discrete.

The number of tomatoes harvested each week from a greenhouse tomato plant.

- Continuous
- Discrete

ID: 6.1-1

- *25. A lab orders a shipment of 100 rats a week, 52 weeks a year, for experiments that the lab conducts. Prices for each weekly shipment of rats follow the distribution below. How much should the lab budget for next year's rat orders assuming this distribution does not change. (Hint: find the expected price.)

Price	\$10.00	\$12.50	\$15.00
Probability	0.45	0.15	0.4

- \$12.38
- \$1,238.00
- \$643.50
- \$3,346,200.00

ID: 6.1-20

26. Suppose that the probability that a person books a hotel using an online travel website is 0.68. For the question that follows, consider a sample of fifteen randomly selected people who recently booked a hotel.

What is the probability that no more than four out of fifteen people used an online travel website when they booked their hotel? Round to three decimal places.

- A. 0.321
- B. 0.111
- C. 0.001
- D. None of these

ID: 6.3-14

27. Male players at the high school, college and professional ranks use a regulation basketball that weighs 22.0 ounces with a standard deviation of 1.0 ounce. Assume that the weights of basketballs are approximately normally distributed.

If a regulation basketball is randomly selected, what is the probability that it will weigh between 20.5 and 23.5 ounces? Round to three decimal places.

- A. 0.866
- B. 0.704
- C. 0.134
- D. 0.267

ID: 6.2-15

28. The average travel time to work for a person living and working in Kokomo, Indiana is 17 minutes. Suppose the standard deviation of travel time to work is 4.5 minutes and the distribution of travel time is approximately normally distributed.

Approximately what percentage of people living and working in Kokomo have a travel time to work that is less than 15.5 minutes? Round to the nearest whole percent.

- A. 63%
- B. 37%
- C. 25%
- D. None of these.

ID: 6.2-19

29. Assume that adults have IQ scores that are normally distributed with a mean of 100 and a standard deviation of 15 (as on the Wechsler test). Find the IQ score separating the top 16% from the others. Round to one decimal place.

- A. 99.2
- B. 114.9
- C. 106.8
- D. 85.0

ID: 6.2-35

30. Fill in the blank to complete the statement.

The collection of the ages of all of a country's first ladies when they married is a _____.

- A. statistic
- B. parameter
- C. population
- D. sample

ID: 7.1-1

31. Marco is interested in whether Proposition P will be passed in the next election. He goes to the university library and takes a poll of 100 students. Since 55% favor Proposition P, Marco believes it will pass. Explain what is wrong with his approach.

Choose the correct answer below.

- A. Marco took too small a sample. There were not enough students surveyed to determine for sure that the proposition will pass.
- B. Marco took a convenience sample. The students may not be representative of the voting population, so the proposition may not pass.
- C. The proportion is too close to 50% for an accurate conclusion to be made.

ID: CR.7.91

32. A group of battery powered toys produced in a day at a factory has a defect rate of 0.5%. Suppose a quality inspector randomly inspects 200 of the toys. Complete the following statement: The quality inspector should expect ____ defective toys, with an error of ____.
-

- A. 10; 5%
- B. 1; 5%
- C. 10; 0.5%
- D. 1; 0.5%

ID: 7.2-15

33. A pollotarian is a person who eats poultry but no red meat. A wedding planner does some research and finds that approximately 3.5% of the people in the area where a large wedding is to be held are pollotarian. Treat the 300 guests expected at the wedding as a simple random sample from the local population of about 200,000.

Suppose the wedding planner assumes that 5% of the guests will be pollotarian so she orders 15 pollotarian meals. What is the approximate probability that more than 5% of the guests are pollotarian and therefore she will **not have enough** pollotarian meals? Round to four decimal places.

- A. 0.079
- B. 0.421
- C. 0.489
- D. None of these

ID: 7.3-3

34. In a sample of 614 patients who underwent a certain type of surgery, 14% experienced complications. Find a 99% confidence interval for the proportion of all those undergoing this surgery who experience complications. Round to three decimal places.
-

- A. (0.104, 0.176)
- B. (0.126, 0.154)
- C. (0.088, 0.192)
- D. (0.118, 0.162)

ID: 7.4-9

35. A random sample of 830 adult television viewers showed that 52% planned to watch sporting event X. The margin of error is 3 percentage points with a 95% confidence. Does the confidence interval support the claim that the majority of adult television viewers plan to watch sporting event X? Why?

- A. Yes; the confidence interval means that we are 95% confident that the population proportion of adult television viewers who plan to watch sporting event X is between 50.5% and 53.5%. This is strong evidence that the true proportion is greater than 50%
- B. No; the confidence interval means that we are 95% confident that the population proportion of adult television viewers who plan to watch sporting event X is between 50.5% and 53.5%. The lower limit of the confidence interval is just too close to 50% to say for sure.
- C. No; the confidence interval means that we are 95% confident that the population proportion of adult television viewers who plan to watch sporting event X is between 49% and 55%. The true proportion could be less than 50%.
- D. Yes; the confidence interval means that we are 95% confident that the population proportion of adult television viewers who plan to watch sporting event X is between 49% and 55%. Since the confidence interval is mostly above 50% it is likely that the true proportion is greater than 50%.

ID: 7.4-5

36. Which of the following does not describe the null hypothesis?

Choose the correct answer below.

- A. It is the research hypothesis
- B. It is a conservative statement about the population parameter
- C. It is a status-quo, business-as-usual statement about the population parameter
- D. All of the above statements describe the null hypothesis

ID: 8.1.RA-2

37. Express the null hypothesis and the alternative hypothesis in symbolic form.

An entomologist writes an article in a scientific journal which claims that fewer than 10 in ten thousand male fireflies are unable to produce light due to a genetic mutation.

- A. $H_0: p = 0.0010$
 $H_a: p < 0.0010$
- B. $H_0: p = 0.0010$
 $H_a: p > 0.0010$
- C. $H_0: p > 0.0010$
 $H_a: p \leq 0.0010$
- D. $H_0: p < 0.0010$
 $H_a: p \geq 0.0010$

ID: 8.1-3

38. A janitor at a large office building believes that his supply of light bulbs has a defect rate that is different than the defect rate stated by the manufacturer. The janitor's null hypothesis is that the supply of light bulbs has a defect rate of $p = 0.09$ (the light bulb manufacturer's stated defect rate). Suppose we do a hypothesis test with a significance level of 0.01. He randomly selects 300 lightbulb and finds 33 defective bulbs. Symbolically, the null and alternative hypothesis are as follows.

$$H_0: p = 0.09 \text{ and } H_a: p > 0.09.$$

The janitor calculates a p-value for the hypothesis test of approximately 0.113. Choose the correct interpretation for the p-value.

- A. The p-value tells us that the probability of concluding that the defect rate is equal to 0.09, when in fact it is greater than 0.09, is approximately 0.113.
- B. The p-value tells us that if the defect rate is 0.113, then the probability that the janitor will have 33 or more defective light bulbs out of 300 is approximately 0.113. At a significance level of 0.01, this would not be an unusual outcome.
- C. The p-value tells us that the true population rate of defective light bulbs is approximately 0.113.
- D. None of these

ID: Instructor-created question

39. A researcher conducts a hypothesis test on a population proportion. Her null and alternative hypothesis are $H_0: p = 0.6$ and $H_a: p < 0.6$. The test statistic and p-value for the test are $z = -1.51$ and p-value = 0.0655. For a significance level of $\alpha = 0.05$, choose the correct conclusion regarding the null hypothesis.

- A. There is insufficient evidence to reject the null hypothesis that the population proportion is equal to 0.6.
- B. There is sufficient evidence to conclude that the population proportion is significantly different from 0.6.
- C. There is sufficient evidence to accept the null hypothesis that the population proportion is equal to 0.6.
- D. There is insufficient evident to determine the significance.

ID: 8.3-10

40. It was determined that the percentage of t's in the English language in the 1800s was 9%. A random sample of 1000 letters from a current newspaper contained 115 t's. Test the hypothesis that the proportion of t's has changed in modern times, using the 0.05 level of significance. Treat the newspaper as a random sample of all letters used.

State the null and alternative hypotheses.

- A. $H_0: p < 0.09$
 $H_a: p > 0.09$
- B. $H_0: p \neq 0.09$
 $H_a: p = 0.09$
- C. $H_0: p = 0.09$
 $H_a: p \neq 0.09$
- D. $H_0: p = 0.09$
 $H_a: p > 0.09$
- E. $H_0: p > 0.09$
 $H_a: p < 0.09$

Determine the z-test statistic.

$z =$ (Round to two decimal places as needed.)

Find the p-value.

p-value = (Round to three decimal places as needed.)

Choose the correct conclusion.

- A. Do not reject H_0 . The proportion of t's is significantly different from 0.09.
- B. Reject H_0 . The proportion of t's is significantly different from 0.09.
- C. Reject H_0 . The proportion of t's is not significantly different from 0.09.
- D. Do not reject H_0 . The proportion of t's is not significantly different from 0.09.

ID: 8.2.41

41. A sprint duathlon consists of a 5 km run, a 20 km bike ride, followed by another 5 km run. The mean finish time of all participants in a recent large duathlon was 1.67 hours with a standard deviation of 0.25 hours. Suppose a random sample of 30 participants in the 40-44 age group was taken and the mean finishing time was found to be 1.62 hours with a standard deviation of 0.40 hours.

Suppose we were to make a histogram of the finishing times of the 30 participants in the 40-44 age group. Would the histogram be a display of the population distribution, the distribution of a sample, or the sampling distribution of means?

- A. distribution of a sample
- B. population distribution
- C. sampling distribution of means

ID: 9.1-6

42. A sprint duathlon consists of a 5 km run, a 20 km bike ride, followed by another 5 km run. The mean finish time of all participants in a recent large duathlon was 1.67 hours with a standard deviation of 0.25 hours. Suppose a random sample of 30 participants in the 40-44 age group was taken and the mean finishing time was found to be 1.62 hours with a standard deviation of 0.40 hours.

What is the **standard error** for the mean finish time of 30 randomly selected participants in the 40-44 age group? Round to three decimal places.

- A. 0.250
 B. 0.055
 C. 0.046
 D. 0.300

ID: 9.1-10

43. Fill in the blank.

The spread of the distribution of the sample mean is _____ the spread of the population.

The spread of the distribution of the sample mean is (1) the spread of the population.

- (1) not related to
 much larger than
 about the same as
 much smaller than

ID: 9.1.RA-2

44. Which of the following is an appropriate interpretation of the confidence level?

Choose the correct answer below.

- A. It is a probability that the confidence interval is accurate.
 B. It is the probability that the population parameter is contained in the confidence interval.
 C. It is a measure of how well the method used to produce the confidence interval performs.
 D. It is a measure of how strong the evidence is that the null hypothesis is true.

ID: 9.3.RA-6

45. The weights at birth of five randomly chosen baby Orca whales were 425, 454, 380, 405, and 426 pounds. Assume the distribution of weights is normally distributed. Find a 95% confidence interval for the mean weight of all baby Orca whales. Use technology for your calculations. Give the confidence interval in the form "estimate \pm margin of error". Round to the nearest tenth of a pound.

- A. 418.0 ± 34.5 pounds
 B. There is not enough information given to calculate the confidence interval.
 C. 384.0 ± 68.0 pounds
 D. 418.0 ± 34.1 pounds

ID: 9.3-14

46. Many couples believe that it is getting too expensive to host an "average" wedding in the United States. According to the website www.costofwedding.com, the average cost of a wedding in the U.S. in 2009 was \$24,066. Recently, in a random sample of 40 weddings in the U.S. it was found that the average cost of a wedding was \$23,224, with a standard deviation of \$2,903. On the basis of this, a 95% confidence interval for the mean cost of weddings in the U.S. is \$22,296 to \$24,152.

Does the confidence interval provide evidence that the mean cost of a wedding has decreased?

- No
 Yes

ID: 9.3-2

47. According to the website www.costofwedding.com, the average cost of flowers for a wedding is \$698. Recently, in a random sample of 40 weddings in the U. S. it was found that the average cost of the flowers was \$734, with a standard deviation of \$102. On the basis of this, a 95% confidence interval for the mean cost of flowers for a wedding is \$701 to \$767.

Choose the statement that is the best interpretation of the confidence interval.

- I. That probability that the flowers at a wedding will cost more than \$698 is greater than 5%.
II. In about 95% of all samples of size 40, the resulting confidence interval will contain the mean cost of flowers at weddings.
III. We are extremely confident that the mean cost of flowers at a wedding is between \$701 and \$767.

- A. II only
 B. III only
 C. I only
 D. II and III are both correct.

ID: 9.3-13

48. Which of the following is measured by the test statistic?

Choose the correct answer below.

- A. The probability that the hypothesized mean is correct.
 B. The level of confidence one has in our conclusion.
 C. How far away the observed mean lies from the hypothesized value of the sample mean.
 D. How far away the observed mean lies from the true population mean.

ID: 9.4.RA-2

49. An economist conducted a hypothesis test to test the claim that the average cost of eating a meal away from home decreased from 2009 to 2010. The average cost of eating a meal away from home in 2009 was \$7.15 per person per meal. Assume that all conditions for testing have been met. He used technology to complete the hypothesis test. Following is his null and alternative hypothesis and the output from his graphing calculator. Choose the statement that contains the correct conclusion regarding the hypothesis and the original claim.

⁴ Click the icon to view the hypotheses and graphing calculator output.

- A. Fail to reject the null hypothesis; there is not sufficient evidence to support the claim that the average cost of eating away from home has decreased since 2009.
- B. Fail to reject the null hypothesis; there is sufficient evidence to support the claim that the average cost of eating away from home has decreased since 2009.
- C. Reject the null hypothesis; there is sufficient evidence to support the claim that the average cost of eating away from home has decreased since 2009.
- D. Reject the null hypothesis; there is not sufficient evidence to support the claim that the average cost of eating away from home has decreased since 2009.

4: Hypothesis and graphing calculator output

$$H_0: \mu = \$7.15$$

$$H_a: \mu < \$7.15$$

T-Test
$\mu < 7.15$
$t = -1.043281062$
$p = .1527187422$
$\bar{x} = 6.95$
$Sx = 1.05$
$n = 30$

ID: 9.4-3

50. Ten people went on a diet for a month. The weight losses experienced (in pounds) are given below. The negative weight loss is a weight gain. Test the hypothesis that the mean weight loss was more than 0, using a significance level of 0.05. Assume the population distribution is Normal.

2, 9, 10, 0, 4, 6, 6, 3, 2, and -2

Determine the null and alternative hypotheses. Choose the correct answer below.

- A. $H_0: \mu < 0$
 $H_a: \mu \geq 0$
- B. $H_0: \mu \neq 0$
 $H_a: \mu = 0$
- C. $H_0: \mu = 0$
 $H_a: \mu > 0$
- D. $H_0: \mu = 0$
 $H_a: \mu < 0$
- E. $H_0: \mu > 0$
 $H_a: \mu \leq 0$
- F. $H_0: \mu = 0$
 $H_a: \mu \neq 0$

The test statistic is .

(Round to two decimal places as needed.)

The p-value is .

(Round to three decimal places as needed.)

Interpret the results of the test.

Since the p-value is (1) the significance level, (2) H_0 . There is

(3) evidence to conclude that the population mean is more than 0 pounds at a significance level of 0.05.

- (1) less than or equal to
 greater than
- (2) do not reject
 reject
- (3) sufficient
 insufficient

ID: 9.4.49

1. B. Categorical variable

2. B. 50%

3. cluster

4. Observational study

5. B. No, this is an observational study and we cannot conclude causation.

6. D. 0.50

7. D. All of these are true statements.

8. Bar graph and pie chart

9. A. 86

10. B. 11.47 in.

11. C. The distribution of women's finish times is less varied than the distribution of men's finish times.

12. B. 16.9 and 42.3 years

13. A.

An IQ of 132 is more unusual because its corresponding z-score, , is further from 0 than the corresponding z-score of for an IQ of 85.

(Type integers or decimals rounded to two decimal places as needed.)

14. B. The spread should be described with the IQR because the distribution will be skewed to the left.

15. B. 25% of the states sentenced more than 15,706 prisoners.

16. A. Yes, it is consistent.

17. (1) -0.05

(2) 0.61

(3) -0.93

18. C. The slope is 0.25 . On average, for each inch taller a parent is, the spouse is about 0.25 inches taller, in the sample.

19. A.

No, we cannot make a prediction because a car that is traveling at 40 mph is outside the range of our data. We would be extrapolating.

20. $\frac{1}{16}$

$\frac{1}{4}$

$\frac{3}{8}$

$\frac{1}{4}$

$\frac{1}{16}$

21. A. 0.395

22. C. 0.699

23. B. 0.301

24. Discrete

25. $\$643.50$

26. C. 0.001

27. A. 0.866

28. B. 37%

29. B. 114.9

30. C. population

31. B.

Marco took a convenience sample. The students may not be representative of the voting population, so the proposition may not pass.

32. D. 1; 0.5%

33. A. 0.079

34. A. (0.104, 0.176)

35. C.

No; the confidence interval means that we are 95% confident that the population proportion of adult television viewers who plan to watch sporting event X is between 49% and 55%. The true proportion could be less than 50%.

36. A. It is the research hypothesis

37. A. $H_0: p = 0.0010$ $H_a: p < 0.0010$

38. B.

The p-value tells us that if the defect rate is 0.113, then the probability that the janitor will have 33 or more defective light bulbs out of 300 is approximately 0.113. At a significance level of 0.01, this would not be an unusual outcome.

39. A. There is insufficient evidence to reject the null hypothesis that the population proportion is equal to 0.6.

40. C. $H_0: p = 0.09$ $H_a: p \neq 0.09$

2.76

0.006

B. Reject H_0 . The proportion of t's is significantly different from 0.09.

41. A. distribution of a sample

42. C. 0.046

43. (1) much smaller than

44. C. It is a measure of how well the method used to produce the confidence interval performs.

45. D. 418.0 ± 34.1 pounds

46. No

47. D. II and III are both correct.

48. C. How far away the observed mean lies from the hypothesized value of the sample mean.

49. A.

Fail to reject the null hypothesis; there is not sufficient evidence to support the claim that the average cost of eating away from home has decreased since 2009.

50. C. $H_0: \mu = 0$ $H_a: \mu > 0$

3.33

0.004

(1) less than or equal to

(2) reject

(3) sufficient
