Test Bank in Probability and Statistics

*The Nature of Probability and Statistics*

1. The collection, organization, summarization, and representation of data is called:
   1. Inferential statistics c. probability
   2. A population d. descriptive statistics
2. What are the measurements or observations for a variable called?
   1. Random variables c. A sample
   2. Data d. A population
3. Which of the following is an area of inferential statistics?
   1. Collecting data c. Generalizing from samples to populations
   2. Organizing data d. Generalizing from populations to samples
4. The number of pounds of garbage generated by people in Great Britain would be an example of what type of variable?
   1. Discrete c. Qualitative
   2. Continuous d. Homogeneous
5. A person’s hair color would be an example of what type of data?
   1. Discrete c. Qualitative
   2. Continuous d. Homogeneous
6. A variable that can be placed into distinct categories, according to some characteristic but that cannot be ranked is called a:
   1. Continuous variable c. Discrete variable
   2. Qualitative variable d. Homogenous variable
7. What is the level of measurement which consists of classifying data into mutually exclusive categories in which no order or ranking can be imposed?
   1. Nominal level c. Interval Level
   2. Ordinal level d. ratio level
8. The salaries of auto workers would be an example of what type of data?
   1. Nominal level c. Interval level
   2. Ordinal level d. Ratio level
9. A person’s religious affiliation would be an example of what type of data?
   1. Nominal level c. Interval level
   2. Ordinal level d. Ratio level

*Frequency Distributions and Graphs*

1. Which of the following should not be done when constructing a frequency distribution?
   1. Select the number of classes desired
   2. Find the range
   3. Use classes that are unequal in width
   4. Use classes that are mutually exclusive
2. What is the midpoint of the class 40 – 80?
   1. 40 b. 60 c. 80 d. 45
3. What is the width of the class 20.7 – 28.3?
   1. 7.7 b. 7.6 c. 28.35 d. 24.5
4. What are the boundaries of the class 2.15 – 3.65?
   1. 2.1 – 3.7 b. 2.14 – 3.66 c. 2.149 – 3.659 d. 2.145 – 3.655
5. What are used to show how many values are accumulated up to and including a specific class?
   1. Ungrouped frequencies c. Cumulative frequencies
   2. Raw data d. Grouped frequencies
6. Using the data 5, 9, 2, 11, 7, 19, and 8, what is the range?
   1. 4 b. 3 c. 14 d. 17
7. What would be the class boundaries for the class 3.52 – 3.58?
   1. 3.515 – 3.585 c. 3.525 – 3.585
   2. 3.500 – 3.600 d. 3.510 – 3.590
8. When constructing a frequency distribution, how many classes should there be?
   1. Between 8 and 12 c. Between 5 and 20
   2. Between 2 and 5 d. Between 15 and 20
9. What is the midpoint of the classes 13.2 – 16.4?
   1. 13.2 b. 14.8 c. 16.4 d. 14.3
10. In the frequency distribution, two classes are 40 – 46 and 47 – 53. What is the class width?
    1. 6 b. 8 c. 7 d. 5
11. In the class 20 – 28, what is the lower class limit?
    1. 20 b. 19 c. 19.5 d. 20.5
12. Using the class 37 – 45, what is the upper class boundary?
    1. 45 b. 45.5 c. 44.5 d. 46
13. Karla wants to construct a frequency distribution for the religious affiliation of the employees at Brown’s department Store. What type of distribution will be used?
    1. Ungrouped c. Categorical
    2. Grouped d. Cumulative
14. Using the class 17.25 – 18.10, what is the upper class limit?
    1. 18.20 b. 18.10 c. 18.105 c. 18.11
15. What is another name for a cumulative frequency graph?
    1. Bar graph c. Frequency polygon
    2. Pictograph d. Ogive
16. The following frequency distribution was obtained.

Class boundaries Frequencies

17.5 – 22.5 5

22.5 – 27.5 7

27.5 – 32.5 10

32.5 – 37.5 12

37.5 – 42.5 13

How many pieces of data were less than 37.5?

A. 12 B. 13 C. 22 D. 34

1. The meteorological records the temperature in Fairbanks, Alaska during each day. What type of graph would be used?
   1. Time series graph c. Pie graph
   2. Pictograph d. Ogive
2. Jimmy is constructing a pie graph to represent the number of g hours his classmates watch television each day. He found that 11/30 watched 2 hours a day. In his pie graph this would represent how many degrees?
   1. 12 b. 132 c. 23 d. 150
3. In the pie chart, if pepperoni pizza was 15/60 of the distribution, how many degrees would be needed for pepperoni?
   1. 900 b. 1200 c. 600 d. 1500
4. An automobile dealer wants to construct a pie graph to represent the different types of cars sold on October. He sold 90 cars, and 20 of the cars were convertibles. The convertibles will represent how many degrees in the circle?
   1. 900 b. 1000 c. 600 d. 800
5. For the data 5, 9, 2, 11, 7, 19, and 8 what is the range?
   1. 3 b. 17 c. 7 d. 19
6. Write a list of the data represented by the stem-and-leaf plot below.



|  |  |
| --- | --- |
| a. | 50, 54, 59, 61, 66, 67, 71, 73, 76, 79, 83, 85, 88 |
| b. | 60, 64, 69, 71, 76, 77, 81, 83, 86, 89, 93, 95, 98 |
| c. | 70, 74, 79, 81, 86, 87, 91, 93, 96, 99, 103, 105, 108 |
| d. | 0, 4, 9, 1, 6, 7, 1, 3, 6, 9, 3, 5, 8 |

1. Ann records how many push-ups she and several of her friends can do in one minute. Draw a stem-and-leaf plot to represent the data she collected.

11, 11, 12, 13, 30, 15, 16, 16, 17

|  |  |
| --- | --- |
| a. | Stem Leaves |
| b. | Stem Leaves |
| c. | Stem Leaves |
| d. | Stem Leaves |

1. Find the range of the data in the stem-and-leaf plot.



|  |  |
| --- | --- |
| a. | 46 |
| b. | 74 |
| c. | 75 |
| d. | 45 |

1. Draw a box-and-whisker plot of the data. 40, 37, 29, 36, 41, 39, 33

|  |  |
| --- | --- |
| a. |  |
| b. |  |
| c. |  |
| d. |  |

1. Which data are represented by the box-and-whisker plot?



|  |  |  |  |
| --- | --- | --- | --- |
| a. | 27, 20, 8, 21, 30, 26, 14 | c. | 27, 22, 8, 13, 30, 26, 14 |
| b. | 27, 22, 8, 21, 32, 26, 14 | d. | 27, 22, 8, 21, 30, 26, 14 |

1. Fifteen mothers were asked how many months old their babies were when they got their first tooth. The results are shown below.

8, 6, 6, 14, 7, 9, 5, 6, 6, 6, 9, 8, 6, 6, 5

Find the range and the outlier(s), if any, of the data set.

|  |  |
| --- | --- |
| a. | range 8; no outliers |
| b. | range 9; outlier 14 |
| c. | range 8; outlier 14 |
| d. | range 9; no outliers |

1. Thirteen golfers were asked what their score was on their last game. The scores are shown below.

86, 75, 72, 85, 78, 88, 74, 74, 83, 85, 77, 57, 77

Find the range and the outlier(s), if any, of the golfers' scores.

|  |  |
| --- | --- |
| a. | range 32; no outliers |
| b. | range 31; outlier 57 |
| c. | range 32; outlier 57 |
| d. | range 31; no outliers |

1. Thirteen bowlers were asked what their score was on their last game. The scores are shown below.

178, 169, 174, 175, 180, 176, 181, 173, 174, 180, 177, 171, 176

Find the range and outlier(s), if any, of the bowlers' scores.

|  |  |
| --- | --- |
| a. | range 11; no outliers |
| b. | range 12; outlier 169 |
| c. | range 12; no outliers |
| d. | range 11; outlier 181 |

1. Only one of the box-and-whisker plots correctly displays data about the ages of team members on a company baseball team. The statements below are all true about the team. Use the statements to correctly choose the box-and-whisker plot.

The youngest member is 20 years old.

About 75% of the members are between 25 and 34 years old.

No one is older than 34 years old.

About 50% of the members are at least 29 years old.

|  |  |
| --- | --- |
| a. |  |
| b. |  |
| c. |  |
| d. |  |

1. The number of eagles observed along a certain river per day over a two week period is listed below. What is a frequency table that represents the data?

1 3 2 5 10 8 9 15 0 7 12 13 6 18

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

1. The number of hours a group of contestants spent preparing for a quiz show are listed below. What is a frequency table that represents the data?

60 25 86 56 45 48 90 75 30 67 90 36 80 15 32 65 61

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

1. The data below shows the average number of text messages a group of students send per day. What is a histogram that represents the data?

20 5 8 22 10 1 7 15 16 12 15 6 13 8

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

1. The data below show the number of games won by a football team in each of the last 15 seasons. What is a histogram that represents the data?

3 4 8 12 7 2 1 15 16 6 10 13 4 1 5

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

1. Is the histogram *uniform, symmetric, or skewed?*



|  |  |
| --- | --- |
| a. | uniform |
| b. | symmetric |
| c. | skewed |

1. Is the histogram *uniform, symmetric, or skewed?*



|  |  |
| --- | --- |
| a. | uniform |
| b. | symmetric |
| c. | skewed |

1. Is the histogram *uniform, symmetric, or skewed?*



|  |  |
| --- | --- |
| a. | uniform |
| b. | symmetric |
| c. | skewed |

1. The data below shows the number of kilowatt hours of electricity used by the tenants of a small apartment building in a given month. What is a cumulative frequency table that represents the data?

80 85 86 90 96 75 66 70

99 65 70 99 70 73 64 92

72 81 88 91 93 69 77 82

|  |  |
| --- | --- |
| a. |  |
| b. |  |
| c. |  |
| d. |  |

1. The data below shows the number of hours a week on average a group of students spend volunteering for community service projects. What is a cumulative frequency table that represents the data?

4 5 10 21 6 2 9 8 12 15 8 14 6 4 6 11 3 2 9 16 22 23

|  |  |
| --- | --- |
| a. |  |
| b. |  |
| c. |  |
| d. |  |

*Data Description*

1. If you look at the coins in your pocket and state that you have more dimes than any other coin, what measure of central tendency are you using?
   1. Mode b. Mean c. Midrange d. Median
2. What is the midpoint of the data array called?
   1. Mode b. Median c. Mean d. Midrange
3. For the data 15, 21, 28, 17, 19, 29, and 25, what is the mean?
   1. 21 b. 19 c. 20 d. 22
4. What is the median of the following data set?

120, 117, 191, 115, 130, 125, 140, 126

1. 125 b. 126 c. 125.5 d. 122.5
2. The following data set was collected: 32, 37, 38, 36, 37, 39, 37, 35, 41, and 31. What is the midrange?
   1. 37 b. 36 c. 35 d. 38
3. The following data was reported on weekly salaries:

Salary Frequency

300 4

350 5

400 8

450 10

500 9

550 12

What is the mean of this distribution?

1. 453.2 b. 362.5 c. 425.0 d. 435.8
2. The following data was reported on weekly salaries:

Salary Frequency

300 4

350 5

400 8

450 10

500 9

550 12

What is the mode?

* 1. 12 b. 550 c. 450 d. 500

1. The following frequency distribution was obtained.

Class Boundaries Frequency

16.5 – 23.5 8

23.5 – 30.5 3

30.5 – 37.5 9

37.5 – 44.5 7

44.5 – 51.5 3

What is the median?

* 1. 38.50 b. 35.17 c. 33.61 d. 39.83

1. What is the weighted mean of the cost of tennis shoes?

Shoe Number Purchased Price

1 8 $35

2 10 $45

3 14 $25

4 6 $55

* 1. $40 b. $37.11 c. $38.27 d. $39.27

1. The following data were collected: 38, 42, 37, 50, 32, 55. Using the unbiased estimator, what is the variance?
   1. 42.3 b. 8.6 c. 62.2 d. 74.7
2. The mean of the sample was 375 and the variance was 88. What is the coefficient of variation?
   1. 25% b. 23.5% c. 2.5% d. 42.6%
3. Charlie had a z-score of – 1.54 on a test that had a mean of 72 and a standard deviation of 13. What was Charlie’s raw score on the test?
   1. 52 b. 92 c. 70 d. 54
4. Which of the following percentiles does not corresponds to the median?

a. P50 b. Q2 c. D5 d. Q3

1. Using the data set 17, 25, 30, 27, 16, 19, 35, 42, 18, 20, 19, and 13, what value corresponds to the 31st percentile?
   1. 18 b. 27 c. 17 d. 30
2. Which measure of central tendency is least affected by extremely high or low values?
   1. Mean b. Median c. Midrange d. Range
3. Which measure of central tendency is the easiest to compute?
   1. Mean b. Median c. Mode d. Midrange
4. In a positively skewed distribution which of the following statements is correct?
   1. The tail is to the left c. The mode is to the right of the median
   2. The mean is to the left of the median d. The mean is to the right of the median
5. The following data on the number of servings of fruits and vegetables eaten in a day by 15 teenagers is as follows: 2, 1, 3, 2, 1, 0, 4, 3, 2, 3, 4, 2, 1, 3, and 2. What is the mode of this data?
   1. 1 b. 2 c. 3 d. 4
6. The following data on the number of servings of fruits and vegetables eaten in a day by 15 teenagers is as follows: 2, 1, 3, 2, 1, 0, 4, 3, 2, 3, 4, 2, 1, 3, and 2. What is the mean of this data?
   1. 2.2 b. 2.1 c. 2.0 d. 2.3
7. Using the following set of data: 60, 52, 48, 32, 62, 45, 48, 52, 60, and 48, what is the median?
   1. 48 b. 52 c. 54 d. 50
8. Using the following set of data: 60, 52, 48, 32, 62, 45, 48, 52, 60, and 48, what is the midrange?
   1. 47 b. 48 c. 52 d. 49
9. Using the following set of data: 60, 52, 48, 32, 62, 45, 48, 52, 60, and 48, what is the mean?
   1. 50 b. 50.7 c. 49.3 d. 50.2
10. The following distribution lists ages of students in a college business class.

Class limits Frequency

20 – 26 7

27 – 33 12

34 – 40 9

41 – 47 4

48 – 54 2

55 – 61 1

What is the mean?

* 1. 35 b. 37 c. 34 d. 33

1. The following distribution lists ages of students in a college business class.

Class limits Frequency

20 – 26 7

27 – 33 12

34 – 40 9

41 – 47 4

48 – 54 2

55 – 61 1

What is the median?

* 1. 31.6 b. 32.6 c. 30.9 d. 31.8

1. What is the range of the data? 18, 25, 32, 16, 19, 40, 50, and 60
   1. 42 b. 44 c. 20 d. 46
2. What is the variance of the given data? 18, 25, 32, 16, 19, 40, 50, and 60
   1. 17.3 b. 16.2 c. 262.9 d. 260.1
3. A distribution has mean of 200 and a standard deviation of 30. For a value of 245, what is the z-score?
   1. 1.50 b. 1.20 c. – 1.50 d. 2.50
4. The first test in Introductory Algebra had a mean of 82 with a standard deviation of 15. If a student made a 75 on the test, what is the corresponding z-score?
   1. – 0.58 b. – 0.47 c. 0.47 d. 0.82
5. What is the interquartile range for the following data? 4, 5, 7, 8, 9, 10
   1. 5 b. 9 c. 4 d. 6
6. Using the data set of: 10, 12, 13, 15, 18, 20, 25, 27, 32, 36, 39, and 40, what is the interquartile range?
   1. 20 b. 19 c. 21 d. 18

*Counting Techniques*

1. An artist has two choices: acrylics and oil, and 5 choices of colors: red, yellow, green, blue, and black. If the artist selects a type of paint and then a color, how many possibilities would there be?
   1. 10 B. 7 C. 5 D. 12
2. A die is rolled. If it is an odd number, the die is rolled again. If it is an even number, a coin is tossed. Using a tree diagram, how many outcomes are possible?
   1. 12 b. 6 c. 8 d. 10
3. A box contains a $1 bill, a $5 bill, a $10 bill, and a $20 bill. A bill is drawn at random and not replaced. A second bill is then drawn. How many outcomes are possible?
   1. 16 b. 8 c. 10 d. 12
4. A box contains a $1 bill, a $5 bill, a $10 bill, and a $20 bill. A bill is drawn at random and not replaced. A second bill is then drawn. How many possible outcomes result in both bills less than $10?
   1. 2 b. 4 c. 6 d. 5
5. A box contains a $1 bill, a $5 bill, a $10 bill, and a $20 bill. A bill is drawn at random and not replaced. A second bill is then drawn. How many possible outcomes result in the second bill drawn being a $20?
   1. 4 b. 3 c. 2 d. 1
6. A nurse has 6 patients to visit. How many different ways can she make her rounds if she visits each patient only once?
   1. 360 b. 21 c. 720 d. 60
7. The password for an e-mail account at West Tech has to consist of 3 letters of the English alphabet followed by two digits. How many different passwords can be selected?
   1. 175,760 b. 11,881,376 c. 1,757,600 d. 676,000
8. A professor gives a 4 question multiple-choice quiz. Each question has five possible responses. How many different answer keys can be made?
   1. 625 b. 1024 c. 3125 d. 20
9. A teen ager has 8 T-shirts, 2 belts, and 5 pairs of jeans. How many different outfits can he wear, assuming that he always wears a belt?
   1. 40 b. 80 c. 16 d. 21
10. A photographer wishes to display nine different snapshots. How many ways can this be done?
    1. 60480 b. 45 c. 181440 d. 362880
11. The letters, “A, B, C, D, E, F, and G”, are used to form a five letter secret code. Repetitions are not allowed. How many different codes are possible?
    1. 2520 b. 16807 c. 120 d. 5040
12. How many different permutations of the letters in the word “baseball” are there?
    1. 56 b. 1680 c. 5040 d. 6720
13. A florist can select five different flowers from a selection of twelve different types. How many ways can she select these flowers? (order is not important)
    1. 95040 b. 3991680 c. 792 d. 5040
14. How many different ways can a researcher select three mice from 18 mice and assign each to a different test?
    1. 5832 b. 4896 c. 918 d. 2448
15. How many different permutations of the letters in the word “repelled” are there?
    1. 3360 b. 6720 c. 336 d. 1680
16. In a small class, there are 8 men and 3 women. A group of 2 men and 1 woman is chosen to do a project together. How many different possible groups can be formed?
    1. 168 b. 84 c. 31 d. 42
17. How many ways can four cards be selected from a standard deck of 52 cards?
    1. 1,624,350 b. 6,497,400 c. 812, 175 d. 270,725
18. How many ways can a committee of 7 people be selected from a group of 15 people?
    1. 77220 b. 6435 c. 5040 d. 7256
19. How many ways can a person select a soft drink and two snacks, if there are 6 soft drinks and 15 snacks to choose from in the vending machines?
    1. 630 b. 1260 c. 90 d. 1575
20. There are 10 true-false questions and 20 multiple choice questions from which to choose a five question quiz. How many ways can the quiz be selected, if there must be at least three multiple choice questions selected?
    1. 51300 b. 99750 c. 115254 d. 15504
21. Using the numbers 0, 2, 4, 6, and 8, a salesman wants to construct a three-digit number. How many different numbers can be constructed?
    1. 15 b. 125 c. 60 d. 27
22. A teacher gives an 8 question true-false quiz. If a student guesses on each question, how many different ways could the 8 questions be answered?
    1. 16 b. 28 c. 64 d. 32
23. The lockers at a gymnasium have 4-digit combination locks. The first digit must be odd, the second digit must be even, and the last 2 digits can be any number from 0 – 9. How many different combinations are there?
    1. 2500 b. 2000 c. 10000 d. 5000
24. A photographer wants to arrange 7 different people for a group picture. How many different possible ways can this be done?
    1. 49 b. 28 c. 16807 d. 5040
25. A business has 6 locations to choose from and wishes to rank only the top 2 locations. How many different ways can this be done?
    1. 36 b. 15 c. 30 d. 18
26. How many different permutations can be made from the letters in the word “HANNAH”?
    1. 90 b. 30 c. 120 d. 60
27. How many combinations of 7 objects are there, taken 4 at a time?
    1. 840 b. 35 c. 27 d. 2401
28. In how many ways can a student select 4 questions form an exam containing 10 questions if he must answer the last question?
    1. 84 b. 504 c. 3024 d. 120
29. Students are selected according to sex (male, female), grade level (freshmen, sophomore) and hair color (blond, brunette, red head). Using a tree diagram, how many different classifications are possible?
    1. 8 b. 7 c. 12 d. 10
30. A box only contains the numbers 6, 7, 8, and 9. If a 6 or 8 is drawn, then a coin is tossed. If a 7 or 9 is drawn, a die is rolled. Using a tree diagram, how many outcomes are possible?
    1. 8 b. 16 c. 10 d. 24

*Probability*

1. Which of the following cannot be considered a probability of an outcome?
   1. 0 b. 23% c. 115% d. 1
2. If a die is rolled one time, what is the probability of getting a number smaller than 5?
   1. 1/6 b. 5/6 c. 1/2 d. 2/3
3. A box contains 9 red marbles, 8 green marbles, and 4 white marbles. If a marble is selected at random, what is the probability that it is not green?
   1. 8/21 b. 13/21 c. 8/21 d. 0
4. A couple plans to have 3 children. What is the probability of getting at least one girl?
   1. 7/8 b. 1/8 c. 1/2 d. ¾
5. What are the odds in favor of tossing three coins and getting one tail?
   1. 3:5 b. 3:8 c. 5:8 d. 5:3
6. In a small sporting goods store there are 3 managers, 8 salesmen, and 5 cashiers. If a person is selected at random, what is the probability that the person is a cashier or a manager?
   1. 5/16 b. 1/2 c. 11/16 d. 13/16
7. A single card is drawn from a deck. What is the probability of selecting a spade or a three?
   1. 17/52 b. 1/4 c. 4/13 d. 1/2
8. In a calculus there are 11 freshmen and 15 sophomores; 5 of the sophomores are females, and 8 of the freshmen are males. If a student is selected at random, what is the probability of selecting a sophomore or a male?
   1. 23/26 b. 3/26 c. 33/26 d. 5/13
9. In a calculus there are 11 freshmen and 15 sophomores; 5 of the sophomores are females, and 8 of the freshmen are males. If a student is selected at random, what is the probability of selecting a freshmen or a female?
   1. 19/26 b. 3/26 c. 9/13 d. 8/13
10. A recent poll by the American Automobile Club found that 40% of those surveyed are worried about aggressive drivers on the road. If 4 people are selected at random, what is the probability that all 4 will be worried about aggressive drivers on the road?
    1. 0.026 b. 0.16 c. 0.016 d. 0.4
11. In a box of thirty AAA batteries, there are three defective batteries. Two batteries are randomly selected and tested. What is the probability that both are defective, if the first one is not replaced after being tested?
    1. 1/100 b. 1/145 c. 1/5 d. 49/290
12. Three cards are drawn from an ordinary deck and not replaced. What is the probability of getting three spades?
    1. 1/64 b. 3/13 c. 11/850 d. 1099/1700
13. The probability that a person makes an A in College Algebra is 0.20. The probability that a person got an A in College Algebra given he or she had a 30 on the ACT test is 0.45. What is the probability of getting an A in College Algebra and getting a 30 on the ACT test?
    1. 0.09 b. 0.90 c. 0.44 d. 0.25
14. A recent poll states that 35% of all American adults are overweight. If 4 adults are selected at random, what is the probability that at least one adult is overweight?
    1. 0.015 b. 0.985 c. 0.821 d. 0.179
15. In a scientific study there are 9 mice, 4 of which are pregnant. If three mice are selected at random, without replacement, what is the probability that all are pregnant?
    1. 1/42 b. 1/21 c. 64/729 d. 5/42
16. A box contains 5 blue marbles, 3 red marbles, and 6 white marbles. If three marbles are drawn, without replacement, what is the probability that all three are blue?
    1. 1/364 b. 27/2744 c. 125/2744 d. 5/182
17. A box contains 5 blue marbles, 3 red marbles, and 6 white marbles. If three marbles are drawn, without replacement, what is the probability that all three are red?
    1. 27/2744 b. 1/364 c. 9/14 d. 6/125
18. A small school bus contains 6 first-graders and 5 second-graders. If two children are ill, what is the probability that at least one is a second-grader?
    1. 8/11 b. 9/11 c. 85/121 d. 96/121
19. In a class of 22 students, there are 15 males and 7 females. If a committee of three is randomly selected, what is the probability that all three are females?
    1. 1/44 b. 343/10648 c. 1/11 d. 251/1088
20. In a class of 22 students, there are 15 males and 7 females. If a committee of three is randomly selected, what is the probability that two are males and 1 is a female?
    1. 3/44 b. 4/55 c. 21/44 d. 7/44
21. Frances gets 18 tails out of 32 tosses of a coin. This would be an example of what type of probability?
    1. Classical b. Empirical c. Subjective d. Uniform
22. A family has four children. How many possible outcomes will be in the sample space?
    1. 4 b. 8 c. 16 d. 32
23. In a recent survey 8 people watched ABC, 7 people watched NBC, and 12 people watched CBS. If a person is picked at random, what is the probability that the person watched NBC or CBS?
    1. 19/27 b. 20/27 c. 5/9 d. 7/27
24. If a die is rolled one time, what is the probability of getting a number less than 5 or an even number?
    1. 7/6 b. 5/6 c. 2/3 d. 1
25. Two dice are rolled. What is the probability of getting a 4 or a 10?
    1. 11/36 b. 1/18 c. 1/3 d. 1/6
26. A card is drawn from an ordinary deck. What is the probability of getting a black jack?
    1. 1/26 b. 1/52 c. 1/13 d. 3/52
27. A single card is drawn from a deck. What is the probability of selecting a queen or a heart?
    1. 17/52 b. 4/13 c. 15/52 d. 9/26
28. The probability that a person will get a cold this year is 0.7. If 4 people are selected at random, what is the probability that all 4 will get a cold this year?
    1. 2.8 b. 0.28 c. 0.2401 d. 0.02401
29. Three cards are drawn from an ordinary deck and not replaced. What is the probability of getting an ace and two jacks?
    1. 1/2197 b. 2/5525 c. 1/2873 d. 4/3315
30. If a family has 5 children, what is the probability that at least one child is a girl?
    1. 1/2 b. 31/32 c. 15/16 d. 29/32
31. What is the probability of getting three kings when 4 cards are drawn from an ordinary deck/
    1. 4/20825 b. 48/270725 c. 192/270725 d. 132/270725
32. For a single draw from a standard deck of cards, what is the probability of obtaining a diamond given that a face card was selected?
    1. 1/3 b. 3/13 c. 1/4 d. 1/2
33. For a single draw from a standard deck of cards, what is the probability of obtaining a heart given that a red card was selected?
    1. 1/4 b. 1/2 c. 1 d. 1/3
34. For a single draw from a standard deck of cards, what is the probability of obtaining a queen given that a black card was selected?
    1. 1/13 b. 2/13 c. 1/2 d. 1/4
35. Two dice are rolled. What is the probability of rolling a sum of eight, given that a double was rolled?
    1. 1/3 b. 1/5 c. 5/36 d. 1/6
36. One die is rolled. What is the probability of rolling a five, given that an even number was rolled?
    1. 0 b. 1 c. 1/3 d. 1/6
37. The probability that Mary will visit Walt Disney World is 0.35. The probability that she will visit Epcot Center is 0.7. The probability that she will visit both places is 0.42. What is the probability that Mary visits Walt Disney World or Epcot Center?
    1. 0.42 b. 0.07 c. 0.63 d. 1.35
38. The staff at a small company includes: 2 secretaries, 40 factory workers, 7 specialists, 3 engineers, and 2 executives. If a person is selected at random, what is the probability that he or she is a factory worker or a specialist?
    1. 7/54 b. 47/54 c. 20/27 d. 13/47
39. A store has three colors of appliances, almond, white, and black. The types of appliances are listed below:

White Almond Black

Refrigerator 12 10 3

Washer 10 8 5

Dryer 11 11 4

If an item is selected at random, what is the probability that it is almond or refrigerator?

* 1. 27/37 b. 22/37 c. 23/37 d. 25/37

1. A store has three colors of appliances, almond, white, and black. The types of appliances are listed below:

White Almond Black

Refrigerator 12 10 3

Washer 10 8 5

Dryer 11 11 4

If an item is selected at random, what is the probability that it is not black?

* 1. 31/37 b. 29/37 c. 23/37 d. 25/37

1. In a recent study, the following data were obtained in response to the question, “Do you favor recycling in your neighborhood?”

Yes No No Opinion

Males 40 15 5

Females 30 20 10

If a person is picked at random, what is the probability that the person is male or is against recycling?

* 1. 19/24 b. 3/4 c. 4/5 d. 2/3

1. In a recent study, the following data were obtained in response to the question, “Do you favor recycling in your neighborhood?”

Yes No No Opinion

Males 40 15 5

Females 30 20 10

If a person is picked at random, what is the probability that the person is male and is in favor of

recycling?

* 1. 1/4 b. 2/5 c. 1/3 d. 3/5

1. If one card is drawn from an ordinary deck of cards, what is the probability of getting a red card or a ten or a queen?
   1. 17/26 b. 19/26 c. 15/26 d. 8/13
2. If one card is drawn from an ordinary deck of cards, what is the probability of getting a diamond or a king or the ace of clubs?
   1. 17/52 b. 15/52 c. 9/26 d. 31/52
3. Three cards are drawn from a deck of cards without replacement. What is the probability of selecting a 2 black cards and a heart?
   1. 1/16 b. 13/204 c. 1/408 d. 1/8
4. In a shipment of 30 televisions, 3 are defective. If 2 sets are randomly selected and tested, what is the probability that both are defective? (The first one is not replaced before the second one is selected)
   1. 1/145 b. 1/100 c. 2/3 d. 3/290
5. A study was conducted to determine the number of years of experience at a small college. The results are as follows:

Experience Instructors Asst. Prof. Professors

1 – 5 years 8 3 2

6 – 10 years 4 15 10

11 – 15 years 1 12 8

If a person is selected at random, what is the probability that a person is an assistant professor given that she or he has 11 – 15 years of experience?

* 1. 4/21 b. 2/5 c. 3/5 d. 4/7

1. A study was conducted to determine the number of years of experience at a small college. The results are as follows:

Experience Instructors Asst. Prof. Professors

1 – 5 years 8 3 2

6 – 10 years 4 15 10

11 – 15 years 1 12 8

If a person is selected at random, what is the probability that a person is an instructor or has 1 - 5 years of experience?

* 1. 2/7 b. 26/63 c. 8/63 d. 8/13

1. 60 students enter a ping pong tournament. They are classified by sex and class in school. The results are in the table.

Juniors Seniors

Males 25 20

Females 10 5

If a person is selected at random, what is the probability that a person is a male, given that the person

is a senior?

* 1. 1/3 b. 4/5 c. 4/9 d. 3/5

1. 60 students enter a ping pong tournament. They are classified by sex and class in school. The results are in the table.

Juniors Seniors

Males 25 20

Females 10 5

If a person is selected at random, what is the probability that a person is a junior, given that the person

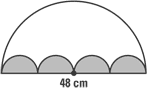
is a female?

* 1. 2/7 b. 1/6 c. 2/3 d. 3/5

1. A committee of 3 people is to be formed from 6 women and 4 men. What is the probability that the committee will consist of 2 women and 1 man?
   1. 19/120 b. 1/6 c. 1/2 d. 1/3
2. A committee of 3 people is to be formed from 6 women and 4 men. What is the probability that the committee will consist of at least 1 man?
   1. 3/4 b. 5/6 c. 2/3 d. 7/10
3. An English professor picks three papers from a group of 25 students. The papers he can select include 10 on abortion, 8 on environment, and 7 on exercise. What is the probability of selecting all 3 papers on abortion?
   1. 6/115 b. 14/575 c. 7/460 d. 8/125

*Geometric Probability*

1. Find the probability that a randomly chosen point in the figure lies in the shaded region.



* 1. 30% B. 25% c. 40% d. 50%

1. Find the probability that a point *A*, randomly selected on , is on the segment .



* 1. 20% b. 25% c. 30% d. 35%

1. Find the probability that a point chosen at random on is on.



* 1. 2/15 b. 4/15 c. 8/15 d. 7/15

1. Find the probability that a point chosen at random on is on.



* 1. 19/27 b. 20/27 c. 23/27 d. 14/27

1. If a point is selected at random, what is the probability that it will lie within the shaded rectangular region rather than the unshaded rectangular region?



* 1. 11/13 b. 11/14 c. 11/15 d. 11/16

1. Half of a circle is inside a square and half is outside, as shown. If a point is selected at random inside the square, find the probability that the point is also inside the circle.



1. Half of a circle is inside a square and half is outside, as shown. If a point is selected at random inside the square, find the probability that the point is also inside the circle.



* 1. b. c. d.



1. Half of a circle is inside a square and half is outside, as shown. If a point is selected at random inside the square, find the probability that the point is not inside the circle.



* 1. b. c. d.



1. A square is inscribed inside a circle as shown. If a point is chosen at random inside the circle, find the probability that the point is also inside the square.



* 1. b. c. d.



*Probability Distribution*

1. What is the mean of the following probability distribution?

x 8 10 12 14

P(x) 0.2 0.3 0.1 0.4

* 1. 11.4 b. 10.6 c. 10.9 c. 11.2

1. What is the mean of the following probability distribution?

x 0 1 2 3 4 5

P(x) 0.2 0.15 0.25 0.05 0.15 0.2

* 1. 2 b. 2.6 c. 2.4 c. 2.8

1. If a gambler rolls two dice and gets a sum of 9, he wins $10, and if he gets a sum of 3, he wins $20. The cost to play the game is $5. What is the expectation of this game?
   1. - $3.06 b. - $2.78 c. $2.22 c. - $1.94
2. What is the variance of the following distribution?

x 0 1 2 3 4

P(x) 0.2 0.3 0.15 0.3 0.05

* 1. 2.7 b. 1.3 c. 1.5 d. 1.6

1. What is the standard deviation of the following distribution?

x 5 6 7 8 9

P(x) 0.12 0.27 0.34 0.22 0.05

* 1. 1.2 b. 1.1 c. 1.3 d. 2.5

1. A box contains ten $1 bills, six $5 bills, and four $10 bills. A person is charged $5 to select a bill. What is the expected value?
   1. - $1 b. $1 c. -$2 d. -$1.50
2. Using the binomial formula, if n = 8 and p = 0.32, what is the probability of getting exactly 4 successes?
   1. 0.324 b. 0.145 c. 0.157 d. 0.186
3. A recent study shows that babies who weigh less than 5.5 pounds at birth are 40% more likely to develop high blood pressure as adults. If 12 babies who weigh less than 5.5 pounds at birth are selected at random, what is the probability that at most two of these babies will develop high blood pressure as adults?
   1. 0.064 b. 0.981 c. 0.083 d. 0.019
4. A recent study shows that babies who weigh less than 5.5 pounds at birth are 40% more likely to develop high blood pressure as adults. If 12 babies who weigh less than 5.5 pounds at birth are selected at random, what is the probability that exactly three of these babies will develop high blood pressure as adults?
   1. 0.142 b. 0.240 c. 0.054 d. 0.083
5. A recent report stated that when eating a sandwich, 32% of U.S. adults cut it in half before eating. If 9 U.S. adults are selected at random, what is the probability that exactly 4 cut their sandwich in half before eating it?
   1. 0.090 b. 0.192 c. 0.168 d. 0.172
6. According to the study by the National Stroke Association, 17% of those surveyed could not name any symptoms of stroke. If 9 people who were surveyed are selected by random, what is the probability that 2 of them could not name any symptoms of a stroke?
   1. 0.189 b. 0.194 c. 0.247 d. 0.282
7. A cancer center in Wisconsin conducted research on women who breastfed their babies and found that those women who breast-fed their babies for a year or longer had 30% reduced risk of breast cancer. If 20 women who breast-fed their babies for a year or longer are selected at random, what is the probability that at most 5 would have a reduced risk of developing breast cancer?
   1. 0.179 b. 0.417 c. 0.583 d. 0.125
8. A cancer center in Wisconsin conducted research on women who breastfed their babies and found that those women who breast-fed their babies for a year or longer had 30% reduced risk of breast cancer. If 20 women who breast-fed their babies for a year or longer are selected at random, what is the probability that more than 8 would have a reduced risk of developing breast cancer?
   1. 0.584 b. 0.595 c. 0.404 d. 0.180
9. A survey of parents revealed that 25% of the parents spent no time each week helping their children with homework, 30% spent 1 – 4 hours per week helping with homework, and 45% spent 5 or more hours per week helping with homework. If sample of 10 parents is randomly selected, what is the probability that 2 parents spent no time helping with homework, 4 spent 1 – 4 hours helping with homework, and 4 parents spent 5 or more hours helping with homework?
   1. 0.065 b. 0.131 c. 0.044 d. 0.108
10. A camera company surveyed 1000 people to ask them how long film remained in their cameras. 58% said film stayed in their camera less than 1 month, 20% said from 1 to 3 months, and 22% said over 3 months. If a sample of 8 people who own cameras is randomly selected, what is the probability that 5 people have filmed that remained in their camera less than 1 month, 1 had film that remained in their camera from 1 to 3 months, and 2 people had film that remained in their camera over 3 months?
    1. 0.107 b. 0.097 c. 0.126 d. 0.138
11. A camera company surveyed 1000 people to ask them how long film remained in their cameras. 58% said film stayed in their camera less than 1 month, 20% said from 1 to 3 months, and 22% said over 3 months. If a sample of 12 people who own cameras is randomly selected, what is the probability that 8 people have filmed that remained in their camera less than 1 month, 2 had film that remained in their camera from 1 to 3 months, and 2 people had film that remained in their camera over 3 months?
    1. 0.147 b. 0.063 c. 0.074 d. 0.097
12. A poison hot-line receives, on the average, four calls per hour on its toll-free number. For any given hour, what is the probability that it will receive at least one call?
    1. 0.9817 b. 0.0916 c. 0.0733 d. 0.8680
13. If approximately 3% of adults cut their sandwiches into squares before eating them, what is the probability that in a group of 150 people, exactly 3 would cut their sandwiches into squares before eating them?
    1. 0.2240 b. 0.1687 c. 0.1898 d. 0.1743
14. If approximately 3% of adults cut their sandwiches into squares before eating them, what is the probability that in a group of 150 people, at most 4 would cut their sandwiches into squares before eating them?
    1. 0.3423 b. 0.1898 c. 0.5321 d. 0.6577
15. A check of 12 people at a bookstore showed that 7 had purchased a hard cover book. If 6 of these 12 people are selected at random, what is the probability that 4 of them had purchased a hardcover book?
    1. 25/66 b. 5/66 c. 15/66 d. 35/66
16. A package of eight batteries is checked to determine if there are any dead batteries. Four batteries are checked. If one or more are dead, the package is not sold. What is the probability that the package will not be sold, if there are actually two dead batteries in the package?
    1. 3/14 b. 4/7 c. 11/14 d. 3/7
17. The number of cartoons watched by first graders on Saturday mornings is shown below:

x 0 1 2 3 4 5

P(x) 0.2 0.2 0.3 0.15 0.1 0.05

What is the mean of the distribution?

* 1. 1.9 b. 2.6 c. 2.4 d. 3.1

1. The number of cartoons watched by first graders on Saturday mornings is shown below:

x 0 1 2 3 4 5

P(x) 0.2 0.2 0.3 0.15 0.1 0.05

What is the standard deviation of the distribution?

* 1. 1.9 b. 2.6 c. 1.4 d. 5.6

1. A person flips a coin 6 times. Let “x” be the number of tails. Which of the following values could not be a value of “x” for this experiment?
   1. 5 b. 6 c. 0 d. 7
2. A probability distribution is constructed for the number of boys a family with two children has. Let “x” be the number of boys. What is the probability for x = 2?
   1. 1/4 b. 1/2 c. 1/3 d. 3/4
3. What value would be needed to complete the following distribution?

x 0 1 2 3 4

P(x) 1/3 1/8 \_\_ 1/4 1/6

* 1. 1/5 b. 1/12 c. 1/24 d. 1/8

1. What is the mean of the following probability distribution?

x 0 1 2 3 4

P(x) 0.2 0.1 0.35 0.05 0.3

* 1. 1.8 b. 2.2 c. 1.9 d. 2.0

1. What is the standard deviation of the following probability distribution?

x 0 2 4 6 8

P(x) 0.25 0.1 0.3 0.25 0.1

* 1. 4.4 b. 2.6 c. 3.7 d. 6.9

1. A student randomly guesses at 7 multiple choice questions. Each question has fie possible choices. What is the probability that the student gets exactly 3 correct?
   1. 0.115 b. 0.227 c. 0.055 d. 0.124
2. A binomial distribution has n = 5, p = 0.35, and x = 2. What is the probability associated with this data?
   1. 0.084 b. 0.336 c. 0.034 d. 0.297
3. If we have a binomial distribution with n = 200 and p = 0.47, what would be the variance?
   1. 49.82 b. 94 c. 7.06 d. 9.70
4. The probability that federal income tax will have 0, 1, or 2 errors is 0.85, 0.1, and 0.05 respectively. If nine randomly selected forms are audited, what is the probability that 6 will have no errors, 2 will have 1 error, and 1 will have 2 errors?
   1. 0.154 b. 0.024 c. 0.048 d. 0.095
5. If there are 100 typographical errors randomly distributed in a 400 page manuscript, what is the probability that a given page contains exactly 1 error?
   1. 0.217 b. 0.347 c. 0.321 d. 0.195
6. 9 people applied for a job as a bank teller. 4 have completed college and 5 have not. If the manager selects three applicants at random, what is the probability that all 3 have not completed college?
   1. 5/42 b. 1/21 c. 11/84 d. 5/84

*The Normal Distributions*

1. What is the area under the normal distribution curve to the right of z = 0.58?
   1. 0.2190 b. 0.7190 c. 0.2810 d. 0.7810
2. What is the area under the normal distribution curve between z = - 1.89 and z = 0?
   1. 0.4706 b. 0.9706 c. 0.0294 d. 0.5294
3. What is the area under the normal distribution curve to the left of z = 0.87?
   1. 0.3078 b. 0.8078 c. 0.1922 d. 0.6922
4. What is the area under the normal distribution curve to the left of z = -2.06?
   1. 0.4803 b. 0.05197 c. 0.9803 d. 0.0197
5. What is the area under the normal distribution curve between z = - 2.01 and z = -1.89?
   1. 0.0072 b. 0.9484 c. 0.0478 d. 0.0516
6. What is the area under the normal distribution curve between z = - 0.5 and z = 1.38?
   1. 0.4767 b. 0.6077 c. 0.2247 d. 0.6138
7. Using the standard normal distribution, what is P(-2.32 < z < 1)?
   1. 0.1485 b. 0.8515 c. 0.6811 d. 0.8311
8. Using the standard normal distribution, what is P(z < 3.01)?
   1. 0.4987 b. 0.9987 c. 0.5013 d. 0.9862
9. Using the standard normal distribution, what is P(1.8 < z < 2.39)?
   1. 0.0275 b. 0.2224 c. 0.0443 d. 0.9557
10. Using the standard normal distribution, what is P(z < -0.35)?
    1. 0.1368 b. 0.6368 c. 0.3632 d. 0.3594
11. Using the standard normal distribution, what is P(z > 2.09)?
    1. 0.4817 b. 0.0183 c. 0.0019 d. 0.5183
12. Using the standard normal distribution, what is P(z > -1.64)?
    1. 0.4495 b. 0.5505 c. 0.0505 d. 0.9495
13. What is the z-value to the right of the mean where 59.18% of the distribution lies to the left of it?
    1. z = 0.23 b. z = 1.33 c. z = -0.23 d. z = 0.24
14. What is the z-value to the right of the mean where 8.05% of the distribution lies to the right of it?
    1. z = -1.40 b. z = 1.40 c. z = 0.20 d. z = 0.51
15. What is the z-value to the left of the mean so that 92.31% of the distribution lies to the right of it?
    1. z = 1.43 b. z = -1.36 c. z = -1.43 d. z = -1.82
16. What is the z-value to the right of the mean where 9.19% of the distribution lies to the left of it?
    1. z = 1.33 b. z = -1.33 c. z = -0.23 d. z = -1.40
17. What z-value corresponds to the 18th percentile?
    1. z = -0.47 b. z = 0.47 c. z = -0.13 d. z = -0.92
18. What z-value corresponds to the 78th percentile?
    1. z = 0.77 b. z = 0.58 c. z = 0.11 d. z = 0.87
19. What z-value corresponds to the 63rd percentile?
    1. z = 1.13 b. z = -0.33 c. z = 0.33 d. z = 0.24
20. The average hourly wage of workers at a fast food restaurant is $5.85 with a standard deviation of $0.35. Assume that the distribution is normally distributed. If a worker at this fast food restaurant is selected at random, what is the probability that the worker earns more than $6.50 an hour?
    1. 0.4686 b. 0.0314 c. 0.0322 d. 0.9686
21. The average hourly wage of workers at a fast food restaurant is $5.85 with a standard deviation of $0.35. Assume that the distribution is normally distributed. If a worker at this fast food restaurant is selected at random, what is the probability that the worker earns less than $5.50 an hour?
    1. 0.1587 b. 0.3413 c. 0.1322 d. 0.8413
22. The average hourly wage of workers at a fast food restaurant is $5.85 with a standard deviation of $0.35. Assume that the distribution is normally distributed. If a worker at this fast food restaurant is selected at random, what is the probability that the worker earns between $5.10 and $6.10 an hour?
    1. 0.2227 b. 0.2551 c. 0.7638 d. 0.7449
23. The average hourly wage of workers at a fast food restaurant is $5.85 with a standard deviation of $0.35. Assume that the distribution is normally distributed. If a worker at this fast food restaurant is selected at random, what is the probability that the worker earns between $5.90 and $6.40 an hour?
    1. 0.4975 b. 0.3861 c. 0.4236 d. 0. 4018
24. A recent study found that the average life expectancy of a person living in Africa is 53 years with a standard deviation of 7.5 years. If a person in Africa is selected at random, what is the probability that the person lives longer than 70 years?
    1. 0.0116 b. 0.4884 c. 0.9884 d. 0.5116
25. A recent study found that the average life expectancy of a person living in Africa is 53 years with a standard deviation of 7.5 years. If a person in Africa is selected at random, what is the probability that the person will die before the age 60?
26. 0.3238 b. 0.8238 c. 0.6762 d. 0.1762
27. At a large department store, the average number of years of service was 13.5 with a standard deviation of 6.2 years. If an employee is picked at random, what is the probability that the employee has worked for the company over 25 years?
    1. 0.4678 b. 0.5322 c. 0.0416 d. 0.0322
28. At a large department store, the average number of years of service was 13.5 with a standard deviation of 6.2 years. If an employee is picked at random, what is the probability that the employee has worked for the company less than 14 years?
    1. 0.5319 b. 0.4681 c. 0.5359 d. 0.5806
29. At a large department store, the average number of years of service was 13.5 with a standard deviation of 6.2 years. If an employee is picked at random, what is the probability that the employee has worked for the company between 8 and 20 years?
    1. 0.6641 b. 0.6125 c. 0.6664 d. 0.6637
30. At a large department store, the average number of years of service was 13.5 with a standard deviation of 6.2 years. If an employee is picked at random, what is the probability that the employee has worked for the company less than 5 years?
    1. 0.4147 b. 0.0853 c. 0.9147 d. 0.0687
31. At Northwest Nursing School, the average score a student must make on an entrance exam is 142 points with a standard deviation of 16 points. If the nursing school can only accept the top 15% of the applicants, what is the cut off score a nurse must make to be considered for this school?
    1. 148 or above b. 159 or above c. 157 or above d. 149 or above
32. A recent study indicated that the average cost of living for a family of four in various cities across the U.S. was $65,351 with a standard deviation of $7712. A company is thinking about relocating to a city with a lower cost of living. They would like to choose a city in the bottom 30% of those surveyed. What is the cutoff for the cost of living that would keep a city eligible for relocation by this company?
    1. $61341 or below b. $58873 or below c. $64512 or below d. $69361 or below
33. The average weight of a box of cereal is 25.2 ounces with a standard deviation of 0.18 ounces. Quality control wants to make certain that the 10% heaviest boxes of cereal are not sent to stores to sell. What would be the cutoff weight for these cereal boxes?
    1. 25.43 ounces or above c. 25.25 ounces or above
    2. 24.97 ounces or above d. 25.36 ounces or above
34. A new hockey franchise is planning to begin league play in the 1999 season. They want to price their tickets in the middle 64% range. If the average price of a ticket is $20 with a standard deviation of $3.50, what are the minimum and maximum prices that this franchise should charge?
    1. $16.50 to $23.50 b. $16.81 to $23.19 c. $16.78 to $23.22 d. $18.74 to $21.26
35. In a given normal distribution, if the mean is 500 and 3.62% of the distribution lies to the right of 572, what is the standard deviation?
    1. 80 b. 40 c. 130 d. 50
36. In a given normal distribution, the standard deviation is 14.4 and 8.27% of the distribution lies to the left of 60. What is the mean?
    1. 80 b. 40 c. 63 d. 72
37. A recent survey indicated that a person living in the U.S. consumes approximately 99 pounds of beef per year with a standard deviation of 16.9 pounds. If a sample of 100 persons living in the U.S. is selected at random, what is the probability that the average beef consumption of this sample is greater than 102 pounds?
    1. 0.4625 b. 0.0375 c. 0.0714 d. 0.0367
38. A recent survey indicated that a person living in the U.S. consumes approximately 99 pounds of beef per year with a standard deviation of 16.9 pounds. If a sample of 100 persons living in the U.S. is selected at random, what is the probability that the average beef consumption of this sample is less than 100 pounds?
    1. 0.2776 b. 0.8736 c. 0.7224 d. 0.2224
39. A recent survey indicated that a person living in the U.S. consumes approximately 99 pounds of beef per year with a standard deviation of 16.9 pounds. If a sample of 100 persons living in the U.S. is selected at random, what is the probability that the average beef consumption of this sample is between 97 and 101.5 pounds?
    1. 0.0496 b. 0.8357 c. 0.8102 d. 0.8116
40. A study showed that the average number of hours children in the U.S. watched television each day is 4 hours with a standard deviation of 1.6 hours. If a group of 64 children is selected at random, what is the probability that the average time these children watch television is more than 3.5 hours a day?
    1. 0.9938 b. 0.4938 c. 0.0062 d. 0.9953
41. A study showed that the average number of hours children in the U.S. watched television each day is 4 hours with a standard deviation of 1.6 hours. If a group of 64 children is selected at random, what is the probability that the average time these children watch television is more than 4.3 hours a day?
    1. 0.4332 b. 0.0688 c. 0.9332 d. 0.0808
42. A report on egg consumption shows that people living in China eat an average of 196 eggs each year with a standard deviation of 18.3 eggs. If a group of 81 Chinese people are selected at random, what is the probability that the average egg consumption of this group will be more than 200 eggs?
    1. 0.0244 b. 0.0233 c. 0.4761 d. 0.0318
43. A report on egg consumption shows that people living in China eat an average of 196 eggs each year with a standard deviation of 18.3 eggs. If a group of 81 Chinese people are selected at random, what is the probability that the average egg consumption of this group will be less than 197 eggs?
    1. 0.6879 b. 0.1879 c. 0.3121 d. 0.6842
44. A report on egg consumption shows that people living in China eat an average of 196 eggs each year with a standard deviation of 18.3 eggs. If a group of 81 Chinese people are selected at random, what is the probability that the average egg consumption of this group will be between 195 and 201 eggs?
    1. 0.3190 b. 0.3052 c. 0.6810 d. 0.6773
45. A report on egg consumption shows that people living in China eat an average of 196 eggs each year with a standard deviation of 18.3 eggs. If an individual Chinese person is selected at random, what is the probability that this person eats more than 201 eggs per year?
    1. 0.1064 b. 0.0069 c. 0.4931 d. 0.3936
46. The average amount spent for a commercial for a network show on Saturday night is $107,000 with a standard deviation of $28,650. A sample of 12 shows is randomly selected by the studio executives. Assume the distribution is normally distributed. What would be sample mean that would cut off the top 15% of all samples of size 12?
    1. $110,226 b. $115,601 c. $109,483 d. $98,399

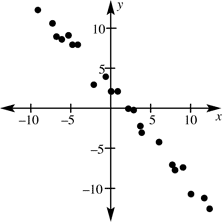
*Correlation and Regression*

1. Describe the correlation shown by the scatter plot.



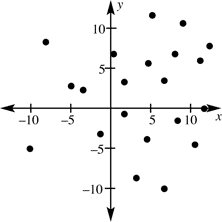
* 1. Positive b. Negative c. Zero d. cannot be determined

1. Describe the correlation shown by the scatter plot.



* 1. Positive b. Negative c. Zero d. cannot be determined

1. Describe the correlation shown by the scatter plot.



* 1. Positive b. Negative c. Zero d. cannot be determined

1. Which equation represents the scatter plot?



|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

1. For the data given, find the equation of the best-fitting line.



|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

1. As study was conducted to determine if there was a relationship between the prices of a non-member of a club paid for various publications and the prices that a member paid for the same publications. Data are provided below.

Nonmember Price (x) 45 38 35 30 27 78 40 65

Member Price (y) 30 25 25 20 18 55 40 50

What is the value of ?



* 1. 358 b. 128164 c. 9999 d. 18232

1. As study was conducted to determine if there was a relationship between the prices of a non-member of a club paid for various publications and the prices that a member paid for the same publications. Data are provided below.

Nonmember Price (x) 45 38 35 30 27 78 40 65

Member Price (y) 30 25 25 20 18 55 40 50

What is the value of ?



* 1. 13401 b. 9999 c. 16335 d. 94154

1. As study was conducted to determine if there was a relationship between the prices of a non-member of a club paid for various publications and the prices that a member paid for the same publications. Data are provided below.

Nonmember Price (x) 45 38 35 30 27 78 40 65

Member Price (y) 30 25 25 20 18 55 40 50

What is the value of the correlation coefficient?

* 1. 0.89 b. 0.94 c. 0.68 d. 0.78

1. As study was conducted to determine if there was a relationship between the prices of a non-member of a club paid for various publications and the prices that a member paid for the same publications. Data are provided below.

Nonmember Price (x) 45 38 35 30 27 78 40 65

Member Price (y) 30 25 25 20 18 55 40 50

What is the slope of the regression line?

* 1. -0.144 b. 1.21 c. 0.738 d. 0.941

1. As study was conducted to determine if there was a relationship between the prices of a non-member of a club paid for various publications and the prices that a member paid for the same publications. Data are provided below.

Nonmember Price (x) 45 38 35 30 27 78 40 65

Member Price (y) 30 25 25 20 18 55 40 50

What is the equation of the line of best fit?

* 1. y = -0.144 + 0.738x c. y = -0.144 + 0.93x
  2. y = 0.738 – 0,144x d. y = 0.144 – 0.738x

1. The equation of a regression line is y = -2.3 + 0.81x. What is the slope if this line?
   1. -2.3 b. 0.81 c. -1.49 d. 0
2. The equation of a regression line is y = 52.5 – 3.1x. What is the value of y when x = 4?
   1. 64.9 b. 49.4 c. 40.1 d. 52.5
3. A study of cities with high job growth was conducted to determine if there was a relationship between the cost-of-doing-business index and the percentage of job growth experienced by these cities. Results are shown below.

Cost Index (x) 90 97 89 92 93 81 92 104 88 99

Percentage

of growth (y) 38 34 34 27 26 23 21 7 21 20

What is the value of ?



* 1. 925 b. 251 c. 859 d. 7021

1. A study of cities with high job growth was conducted to determine if there was a relationship between the cost-of-doing-business index and the percentage of job growth experienced by these cities. Results are shown below.

Cost Index (x) 90 97 89 92 93 81 92 104 88 99

Percentage

of growth (y) 38 34 34 27 26 23 21 7 21 20

What is the value of ?



* 1. 925 b. 6513 c. 63001 d. 7021

1. A study of cities with high job growth was conducted to determine if there was a relationship between the cost-of-doing-business index and the percentage of job growth experienced by these cities. Results are shown below.

Cost Index (x) 90 97 89 92 93 81 92 104 88 99

Percentage

of growth (y) 38 34 34 27 26 23 21 7 21 20

What is the value of ?



* 1. 232175 b. 325441 c. 22997 d. 21698

1. A study of cities with high job growth was conducted to determine if there was a relationship between the cost-of-doing-business index and the percentage of job growth experienced by these cities. Results are shown below.

Cost Index (x) 90 97 89 92 93 81 92 104 88 99

Percentage

of growth (y) 38 34 34 27 26 23 21 7 21 20

What is the value of the correlation coefficient?

* 1. -0.57 b. -0.43 c. -0.62 d. -0.39

1. A credit card company wants to see how strong the relationship is between the amount of money a person makes per year and the amount they charge on their credit cards. Data are listed below.

Income (in thousands) (x) 33 26 35 43 28 40 41 29 27

Amount Charged (y) 2780 2300 3080 3690 2250 3334 3187 2491 2370

What is the value of ?



* 1. 91204 b. 302 c. 289 d. 315

1. A credit card company wants to see how strong the relationship is between the amount of money a person makes per year and the amount they charge on their credit cards. Data are listed below.

Income (in thousands) (x) 33 26 35 43 28 40 41 29 27

Amount Charged (y) 2780 2300 3080 3690 2250 3334 3187 2491 2370

What is the value of ?



* 1. 25482 b. 91204 c. 10474 d. 13612

1. A credit card company wants to see how strong the relationship is between the amount of money a person makes per year and the amount they charge on their credit cards. Data are listed below.

Income (in thousands) (x) 33 26 35 43 28 40 41 29 27

Amount Charged (y) 2780 2300 3080 3690 2250 3334 3187 2491 2370

What is the correlation coefficient?

* 1. 0.97 b. 0.99 c. 0.86 d. 0.92

1. A credit card company wants to see how strong the relationship is between the amount of money a person makes per year and the amount they charge on their credit cards. Data are listed below.

Income (in thousands) (x) 33 26 35 43 28 40 41 29 27

Amount Charged (y) 2780 2300 3080 3690 2250 3334 3187 2491 2370

Using the fact that and , what is the y-intercept for the regression line for this data?



* 1. 77.02 b. 116.90 c. 246.94 d. 217.83

1. A credit card company wants to see how strong the relationship is between the amount of money a person makes per year and the amount they charge on their credit cards. Data are listed below.

Income (in thousands) (x) 33 26 35 43 28 40 41 29 27

Amount Charged (y) 2780 2300 3080 3690 2250 3334 3187 2491 2370

Using the fact that and , what is the slope of the regression line for this data?



* 1. 246.94 b. 77.02 c. 4261.83 d. 89.01

1. A credit card company wants to see how strong the relationship is between the amount of money a person makes per year and the amount they charge on their credit cards. Data are listed below.

Income (in thousands) (x) 33 26 35 43 28 40 41 29 27

Amount Charged (y) 2780 2300 3080 3690 2250 3334 3187 2491 2370

Using the regression line, what would be the amount charged by a person who makes $37,000 a year?

* 1. $2850 b. $11,987 c. $3362 d. $3097

1. A teacher wanted to see if there was a relationship between the number of absences a student had in her class and the final grade (y) of the student. The y-intercept for the line of best fit was found to be 96.8 and the slope of the line was found to be – 2.67. What would be the equation of the line of best fit?
   1. y = -2.67 + 96.8x c. y = 96.8 – 2.67x
   2. y = 96.8 + 2.67x d. y = 2.67 – 96.8x
2. A teacher wanted to see if there was a relationship between the number of absences a student had in her class and the final grade (y) of the student. The y-intercept for the line of best fit was found to be 96.8 and the slope of the line was found to be – 2.67. What would be the final grade for a student who missed 10 classes?
   1. 70 b. 68 c. 65 d. 73
3. A teacher wanted to see if there was a relationship between the number of absences a student had in her class and the final grade (y) of the student. The y-intercept for the line of best fit was found to be 96.8 and the slope of the line was found to be – 2.67. What would be the final grade for a student who missed 4 classes?
   1. 84 b. 92 c. 87 d. 86
4. A teacher wanted to see if there was a relationship between the number of absences a student had in her class and the final grade (y) of the student. The y-intercept for the line of best fit was found to be 96.8 and the slope of the line was found to be – 2.67. If a student had a final grade of 65, using the line of best fit, approximately how many absences did this student have?
   1. 9 b. 11 c. 12 d. 10
5. The following data were obtained for the life expectancy of males and females in eight African countries.

Females (x) 53 61 53 63 66 67 54 58

Males (y) 54 60 50 59 63 61 52 57

What is the slope of the regression line?

* 1. 2.35 b. 12.32 c. 0.75 d. 1.17

1. The following data were obtained for the life expectancy of males and females in eight African countries.

Females (x) 53 61 53 63 66 67 54 58

Males (y) 54 60 50 59 63 61 52 57

What is the equation of the regression line?

* 1. y = 0.75 + 12.32x c. y = 12.32 + 1.17x
  2. y = 12.32 + 0.75x d. y = 5.87 + 0.75x

1. The following data were obtained for the life expectancy of males and females in eight African countries.

Females (x) 53 61 53 63 66 67 54 58

Males (y) 54 60 50 59 63 61 52 57

What would be the life expectancy for a male in an African country where the female life expectancy is 58 years?

* 1. 54 b. 53 c. 76 d. 56

1. The following data was collected:

x 6 7 10 5 7 8 12 5

y 8 10 8 9 9 12 15 10

The scatter plot of this data would indicate what type of linear relationship?

* 1. Negative b. No relationship c. Positive d. Constant

1. Which of the following could not be a value of a correlation coefficient?
   1. 0.98 b. -0.76 c. -1.00 d. 1.34
2. A regression line was calculated as y = 42.5 + 3.1x. What is the predicted value of y when x = 2?
   1. 104.5 b. 36.3 c. 91.2 d. 48.7
3. If the correlation coefficient is 0.79, then what type of slope will the regression line have?
   1. Positive b. Negative c. Constant d. Zero

*Sampling and Simulation*

1. The following numbers were randomly generated by a computer: 28 21 43 83 64 19 40 53 42 27 74 90 99 79 83 45 16 10 75 46

Any odd number represents a $5 bill and any even number represents a $20 bill. How many $20 bills were generated?

* 1. 9 b. 10 c. 11 d. 8

1. The following numbers were randomly generated by a computer: 35 50 20 27 76 33 31 5 49 64 63 12 13 4 30 45 29 16 71 11 89 40 81 77 46

Numbers 1 – 19 represent freshmen, 20 – 49 represents sophomores, 50 – 69 represent juniors, and 70 – 89 represent seniors. How many sophomores were selected?

* 1. 5 b. 3 c. 10 d. 11

1. The following numbers were randomly generated by a computer: 35 50 20 27 76 33 31 5 49 64 63 12 13 4 30 45 29 16 71 11 89 40 81 77 46

Numbers 1 – 19 represent freshmen, 20 – 49 represents sophomores, 50 – 69 represent juniors, and 70 – 89 represent seniors. How many seniors were selected?

* 1. 3 b. 5 c. 6 d. 11

1. The following numbers were randomly generated by a computer: 35 50 20 27 76 33 31 5 49 64 63 12 13 4 30 45 29 16 71 11 89 40 81 77 46

Numbers 1 – 19 represent freshmen, 20 – 49 represents sophomores, 50 – 69 represent juniors, and 70 – 89 represent seniors. How many freshmen were selected?

* 1. 6 b. 3 c. 5 d. 7

1. The following numbers were randomly generated by a computer: 35 50 20 27 76 33 31 5 49 64 63 12 13 4 30 45 29 16 71 11 89 40 81 77 46

Numbers 1 – 19 represent freshmen, 20 – 49 represents sophomores, 50 – 69 represent juniors, and 70 – 89 represent seniors. If each freshman receives a ranking of 1, each sophomore a ranking of 2, each junior a ranking of 3, and each senior a ranking of 4, what is the average ranking of this simulation?

* 1. 2 b. 3 c. 2.28 d. 3.75

1. The 50 states in the U.S were numbered alphabetically and a researcher decided to select all states beginning with the letters “N” and “W” to survey these states on unemployment rates. What type of sampling technique is the researcher employing?
   1. Stratified b. Random c. Cluster d. Systematic
2. A psychology teacher taught a large lecture class of 200 beginning psychology students. She wanted to calculate the average on her first examination by selecting every eighth students’ test score and finding the average of these scores. What type of sampling technique is this psychology teacher utilizing?
   1. Stratified b. Random c. Cluster d. Systematic
3. A pollster wanted to determine how much support a new library tax would have in a major metropolitan area. He divides the metro area into 5 regions, SE, SW, NE, NW, and Central and surveys 100 voters from each of these regions. What type of sampling technique is the pollster using?
   1. Stratified b. Random c. Cluster d. Systematic
4. The game “Wheel of Fortune” has three contestants. A die is rolled to represent the winner. Let the number 1 and 6 represent contestant A winning the game, the numbers 2 and 4 represent contestant B winning the game, and the numbers 3 and 5 represents contestant C winning the game. The following numbers were rolled:

3 6 5 5 3 1 2 3 3 2 5 3 4 1 5 2 1 6 4 3 1 6 2 5 3 How many time did contestant A win?

* 1. 12 b. 8 c. 10 d. 7

1. The game “Wheel of Fortune” has three contestants. A die is rolled to represent the winner. Let the number 1 and 6 represent contestant A winning the game, the numbers 2 and 4 represent contestant B winning the game, and the numbers 3 and 5 represents contestant C winning the game. The following numbers were rolled:

3 6 5 5 3 1 2 3 3 2 5 3 4 1 5 2 1 6 4 3 1 6 2 5 3 How many time did contestant B win?

* 1. 7 b. 8 c. 6 d. 10

1. The game “Wheel of Fortune” has three contestants. A die is rolled to represent the winner. Let the number 1 and 6 represent contestant A winning the game, the numbers 2 and 4 represent contestant B winning the game, and the numbers 3 and 5 represents contestant C winning the game. The following numbers were rolled:

3 6 5 5 3 1 2 3 3 2 5 3 4 1 5 2 1 6 4 3 1 6 2 5 3

Which contestant won the most game?

* 1. Contestant A c. Contestant C
  2. Contestant B d. There was no clear cut winner

1. A die is rolled to simulate an 18-hole round of golf. A 1 represents hole-in-one, a 2 an eagle, a 3 a birdie, a 4 par, a 5 a bogey, and a 6 a double-bogey on the hole. The following eighteen numbers were rolled:

2 3 5 3 6 1 5 4 4 5 2 3 6 5 3 4 4 4

How many eagles did this golfer make?

* 1. 1 b. 2 c. 3 d. 4

1. A die is rolled to simulate an 18-hole round of golf. A 1 represents hole-in-one, a 2 an eagle, a 3 a birdie, a 4 par, a 5 a bogey, and a 6 a double-bogey on the hole. The following eighteen numbers were rolled:

2 3 5 3 6 1 5 4 4 5 2 3 6 5 3 4 4 4

On how many holes did this golfer make par?

* 1. 4 b. 5 c. 3 d. 7

1. A die is rolled to simulate an 18-hole round of golf. A 1 represents hole-in-one, a 2 an eagle, a 3 a birdie, a 4 par, a 5 a bogey, and a 6 a double-bogey on the hole. The following eighteen numbers were rolled:

2 3 5 3 6 1 5 4 4 5 2 3 6 5 3 4 4 4

On how many holes did this golfer have a score over par (bogey or double-bogey)?

* 1. 5 b. 7 c. 6 d. 4

1. A die is rolled to simulate an 18-hole round of golf. A 1 represents hole-in-one, a 2 an eagle, a 3 a birdie, a 4 par, a 5 a bogey, and a 6 a double-bogey on the hole. The following eighteen numbers were rolled:

2 3 5 3 6 1 5 4 4 5 2 3 6 5 3 4 4 4

If the number rolled indicates the score on the hole, what was this golfer’s score on all 18 holes?

* 1. 69 b. 72 c. 68 d. 70

1. A die is rolled to simulate an 18-hole round of golf. A 1 represents hole-in-one, a 2 an eagle, a 3 a birdie, a 4 par, a 5 a bogey, and a 6 a double-bogey on the hole. The following eighteen numbers were rolled:

2 3 5 3 6 1 5 4 4 5 2 3 6 5 3 4 4 4

What was the golfer’s average score per hole?

* 1. 3.26 b. 11.5 c. 3.83 d. 4

1. The following numbers were randomly generated:

68 96 37 69 97 19 50 29 66 74 8 58 5 13 30 69 65 50 36 47 22 15 19 44 9 11 16

Starting with the number 97, select every other number until 7 numbers are selected. If the odd numbers represent tails and even numbers represent heads, how many heads were generated?

* 1. 3 b. 4 c. 5 d. 6

1. Cards are turned over until a heart is face up. D = diamonds, S = spades, C = clubs, H = hearts. The experiment is repeated 10 times. Results are listed below:

Trial Results

1 S, S, D, S, C, S, S, C, D, C, H

2 C, D, H

3 D, H

4 D, H

5 S, D, C, S, D, S, H

6 D, S, H

7 D, D, S, D, H

8 S, C, D, H

9 S, C, H

10 S, S, H

Using this simulation, what is the average?

* 1. 4 b. 4.3 c. 5 d. 4.7

1. A box contains six $5 bills, two $10 bills, and two $20 bills. The number 0 and 9 represent a $10 bill, the numbers 1 and 8 represent a $20 bill, and the numbers 2 through 7 represent a $5 bill. The following numbers were generated:

9 6 6 8 1 2 7 0 8 6 3 2 3 5 2

How many $20 bills were generated?

* 1. 6 b. 3 c. 2 d. 4

1. A die is rolled to simulate an 18-hole round of golf. A 1 represents hole-in-one, a 2 an eagle, a 3 a birdie, a 4 par, a 5 a bogey, and a 6 a double-bogey on the hole. The following eighteen numbers were rolled:

2 3 5 3 6 1 5 4 4 5 2 3 6 5 3 4 4 4

Using this simulation, what is the average?

* 1. $8.67 b. $9.00 c. $4.53 d. $8.00

1. Which of the following is not a basic sampling technique?
   1. Systematic b. Cluster c. Random d. Monte Carlo
2. Which of the following techniques is a correct way to get a random sample?
   1. Asking a question by radio and having the listeners call in their answers
   2. Asking people to respond by mail
   3. Asking the “person on the street”
   4. Using random numbers to select the sample
3. Setting up probability experiments that mimic the behavior of real life events is called:
   1. Random sampling c. Systematic sampling
   2. Simulation d. Trial and error
4. Harry and Fred are playing a video game. The random digits 1 through 5 are used to represent a game that Harry wins and 6, 7, 8, and 9 are used to represent a game that Fred wins. If they play 5 games, and the random numbers 76219 is selected, which of the following is the correct sequence of winners? (Use H for when Harry wins and F when Fred wins)
   1. HHFFH b. FHFFH c. HFHHF d. FFHHF
5. Which of the following is not a reason why computers have played an important role in simulation techniques?
   1. They can generate random numbers
   2. They can perform experiments faster than human
   3. They can compute probabilities faster than human
   4. They are very expensive to use
6. Which of the following is not a reason to use a sample rather than a population?
   1. It saves the researcher time
   2. It enables the researcher to get more detailed information about particular subject
   3. It is more costly than using the population
   4. It allows the researcher to get information that may not be possible to obtain otherwise
7. If all possible samples of a specific size have the same chance of being selected, what type of sampling technique is being used?
   1. Random sampling c. Cluster sampling
   2. Systematic sampling d. Stratified sampling
8. A statistician selected every tenth element of a population for the sample. What sampling technique is being used?
   1. Random sampling c. Systematic sampling
   2. Stratified sampling d. Cluster sampling
9. A researcher divided up his population into 5 groups: Northeast, Southeast, Midwest, Southwest, and Northwest. What is this type of sampling technique called?
   1. Random sampling c. Systematic sampling
   2. Stratified sampling d. Cluster sampling
10. Which of the following is not an advantage of using a cluster sample instead of other types of samples?
    1. It can reduce cost
    2. It is convenient to use
    3. It can simplify field work
    4. The groups of people tends to be more homogeneous
11. Ned Banks is running for the district 15 council seat. He decides to poll 3 blocks in his district to determine his chance of winning the seat. What type of sampling is Ned using?
    1. Cluster sampling c. Systematic sampling
    2. Random sampling d. Stratified sampling
12. A quality control engineer is checking parts coming off the assembly line. What type of sampling is being used?
    1. Cluster sampling c. Sequence sampling
    2. Random sampling d. Double sampling
13. Which of the following would not be a reason that NASA would use space shuttle flight simulators instead of studying the actual situation?
    1. Less costly c. Less time-consuming
    2. Less dangerous d. Less efficient
14. Subjects are randomly assigned to two groups, and one group was given an herb and the other group a placebo. After 6 months, the numbers of respiratory tract infections each group had were compared. This type of study is an example of:
    1. Observational c. Experimental
    2. Survey d. Descriptive
15. A researcher stood at a busy intersection to see if the color of an automobile a person drives is related to running red lights. This type of study is an example of:
    1. Survey c. Descriptive
    2. Experimental d. Observational
16. In each of these statements, tell whether descriptive or inferential statistics have been used.
    1. In the year 2010, 148 million Americans will be enrolled in an HMO (Source: *USA Today*).
    2. Nine out of ten on-the-job fatalities are men (Source: *USA Weekend*).
    3. Expenditures of the cable industry were $5.66 billion in 1996 (Source: *USA Today*).
    4. The median household income for people aged 25 – 34 is $35,888 (Source: *USA Today*).
    5. “Allergy therapy makes bees go away” (Source: *Prevention*).
    6. Drinking decaffeinated coffee can raise cholesterol levels by 7% (Source: *American Heart Association*).
    7. The national average annual medicine expenditure per person is $1052 (Source: *The Greenburg Tribune Review*).
    8. Experts say that mortgage rates may soon hit bottom (Source: *USA Today*).