**You must show your work.** Your Score:

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

**Find the probability.**

**Solve the problem.**

1) How many 6-digit numbers can be formed using the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, if repetitions of digits are allowed? 1) \_\_\_\_\_\_\_

A) 899,999 six-digit numbers B) 900,000 six-digit numbers

C) 1,000,000 six-digit numbers D) 46,656 six-digit numbers

**Write a matrix to display the information.**

2) x = -10 2) \_\_\_\_\_\_\_

A) Undefined B) 0 C) 1 D) -10

**Find the amount that should be invested now to accumulate the following amount, if the money is compounded as indicated.**

3) $ 21,000 at 4% compounded semiannually for 8 yr 3) \_\_\_\_\_\_\_

A) $ 15,344.49 B) $ 28,828.50 C) $ 5702.64 D) $ 15,297.36

**At one high school, students can run the 100-yard dash in an average of 15.2 seconds with a standard deviation of .9 seconds. The times are very closely approximated by a normal curve. Find the percent of times that are:**

4) Less than 17 seconds 4) \_\_\_\_\_\_\_

A) 84% B) 98% C) 2.5% D) 97.7%

**The table shows, for some particular year, a listing of several income levels and, for each level, the proportion of the population in the level and the probability that a person in that level bought a new car during the year. Given that one of the people who bought a new car during that year is randomly selected, find the probability that that person was in the indicated income category. Round your answer to the nearest hundredth.**

|  |  |  |
| --- | --- | --- |
| **Income Level** | **Proportion****Of population** | **Probability that** **Bought a new car** |
|  **$0 - 4,999** | **5.2%** | **.02** |
| **$5,000 - 9,999** | **6.4%** | **.03** |
| **$10,000 - 14,999** | **5.4%** | **.06** |
| **$15,000 - 19,999** | **8.7%** | **.07** |
| **$20,000 – 24,999** | **9.4%** | **.09** |
| **$25,000 - 29,999** | **10.2%** | **.10** |
| **$30,000 – 34,999** | **13.8%** | **.11** |
| **$35,000 - 39,999** | **10.7%** | **.13** |
| **$40,000 - 49,999** | **15.5%** | **.15** |
| **$50,000 and over** | **14.7%** | **.19** |

5) $50,000 and over 5) \_\_\_\_\_\_

A) .24 B) .25 C) .28 D) .22

**Provide an appropriate response.**

6) A six-sided die is rolled n times. If the probablity a particular even side comes up is 1/9 and the probability a particular odd side comes up is 2/9, can you consider this a Bernoulli trial in determining the probability of rolling five 4's in 10 rolls? 6) \_\_\_\_\_\_

A) No B) Yes

**Find the odds.**

7) Find the odds in favor of drawing a red marble when a marble is selected at random from a bag containing 2 yellow, 5 red, and 6 green marbles. 7) \_\_\_\_\_\_

A) 1 to 5 B) 5 to 13 C) 5 to 8 D) 8 to 13

**Provide an appropriate response.**

8) Assume that E and F are events. Must the union of E and F also be an event? Must the intersection of E and F also be an event? 8) \_\_\_\_\_\_

A) Only the union must be an event.

B) Only the intersection must be an event.

C) Neither the union nor the intersection must be an event.

D) Both the union and the intersection must be events.

**Of the 2,598,960 different five-card hands possible from a deck of 52 playing cards, how many would contain the following cards?**

9) All black cards 9) \_\_\_\_\_\_

A) 32,890 hands B) 131,560 hands

C) 263,120 hands D) 65,780 hands

**Use a Venn diagram to answer the question.**

10) A local television station sends out questionnaires to determine if viewers would rather see a documentary, an interview show, or reruns of a game show. There were 800 responses with the following results:

 240 were interested in an interview show and a documentary, but not reruns;

 32 were interested in an interview show and reruns, but not a documentary;

 112 were interested in reruns but not an interview show;

 192 were interested in an interview show but not a documentary;

 80 were interested in a documentary and reruns;

 48 were interested in an interview show and reruns;

 64 were interested in none of the three.

How many are interested in exactly one kind of show? 10) \_\_\_\_\_\_

A) 384 B) 364 C) 394 D) 374

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

**A die is rolled twice. Write the indicated event in set notation.**

11) The first roll is a 5 and so is the second. 11) \_\_\_\_\_\_

A) {( 5, 1), ( 5, 2), ( 5, 3), ( 5, 4), ( 5, 5), ( 5, 6)}

B) (1, 5), (2, 5), (3, 5), (4, 5), (5, 5), (6, 5)}

C) {( 5, 5), (1, 5), ( 5, 1), ( 5, 5), (5, 5)}

D) {( 5, 5)}

**Solve the problem.**

12) The following data show the list price, x, in thousands of dollars, and the dealer invoice price, y, also in thousands of dollars, for a variety of sport utility vehicles. Find a linear equation that approximates the data, using the points (16.5, 16.1) and (20.0, 18.3).

 12) \_\_\_\_\_\_

|  |  |
| --- | --- |
| List Price | Dealer Invoice Price |
| 16.5 | 16.1 |
| 17.6 | 17.0 |
| 20.7 | 18.2 |
| 23.1 | 19.3 |
| 20.0 | 18.3 |
| 24.6 | 21.0 |

A) y = .629x + 6.38 B) y = 1.59x - 9.11

C) y = 1.59x - 10.2 D) y = .629x + 5.73

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

**Solve the problem.**

13) An electronics store stocks VCRs, stereo systems, and television sets. They have limited storage space and can stock a total of at most 150 of these three machines. They know from past experience that they should stock twice as many VCRs as stereo systems and at least 60 television sets. If each VCR sells for $ 450, each stereo system sells for $ 2100, and each television set sells for $ 750, how many of each should be stocked and sold for maximum revenues? 13) \_\_\_\_\_\_

A) 54 VCRs, 27 stereo systems, 69 television sets

B) 60 VCRs, 30 stereo systems, 60 television sets

C) 42 VCRs, 21 stereo systems, 87 television sets

D) 45 VCRs, 45 stereo systems, 60 television sets

**Assume the distribution is normal. Use the area of the normal curve to answer the question. Round to the nearest whole percent.**

14) The mean clotting time of blood is 7.35 seconds, with a standard deviation of .35 seconds. What is the probability that blood clotting time will be less than 7 seconds? 14) \_\_\_\_\_\_

A) 16% B) 14% C) 15% D) 84%

**At one high school, students can run the 100-yard dash in an average of 15.2 seconds with a standard deviation of .9 seconds. The times are very closely approximated by a normal curve. Find the percent of times that are:**

15) Greater than 16.1 seconds 15) \_\_\_\_\_\_

A) 2% B) 15.5% C) 16% D) 13.5%

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

**Solve the problem.**

16) In how many ways can 7 people be chosen and arranged in a straight line, if there are 9 people from whom to choose? 16) \_\_\_\_\_\_

A) 72 ways B) 63 ways

C) 144 ways D) 181,440 ways

**Find the slope of the line passing through the given pair of points.**

17) ( 3, 2) and ( 3, 9) 17) \_\_\_\_\_\_

A) 11/6 B) Undefined C) 0 D) - 7/6

**Determine whether the given events are mutually exclusive.**

18) Wearing a coat and wearing a sweater 18) \_\_\_\_\_\_

A) Yes B) No

**Provide an appropriate response.**

19) Suppose that S and T are mutually exclusive events. Which of the following statements is true?

19) \_\_\_\_\_\_

A) S and T cannot possibly be independent.

B) S and T may or may not be independent.

C) S and T must also be independent.

**A company installs 5000 light bulbs, each with an average life of 500 hours, standard deviation of 100 hours, and distribution approximated by a normal curve. Find the approximate number of bulbs that can be expected to last the specified period of time.**

20) Less than 500 hours 20) \_\_\_\_\_\_

A) 1000 B) 2400 C) 2500 D) 3000

**Find the probability.**

21) A bag contains 13 balls numbered 1 through 13. What is the probability that a randomly selected ball has an even number? 21) \_\_\_\_\_\_

A) 6 B) ½ C) 13/6 D) 6/13

**Find the standard deviation of the data summarized in the given frequency table.**

22) The test scores of 40 students are summarized in the frequency table below. Find the standard deviation.

|  |  |
| --- | --- |
| Score | Students |
| 50-59 | 12 |
| 60-69 | 8 |
| 70-79 | 10 |
| 80-89 | 5 |
| 90-99 | 5 |

 22) \_\_\_\_\_\_

A) 13.8 B) 12.4 C) 14.5 D) 13.1

**Solve the problem.**

23) Jerry builds rocking chairs and porch swings and sells them a a local flea market. The lumber requirements for each type of item are summarized in the table below.

|  |  |  |
| --- | --- | --- |
|  | Rocking Chair | Porch Swing |
| 2x4’s | 1 | 5 |
| 2x6’s | 1 | 2 |
| 1x4’s | 2 | 3 |

Currently, Jerry has 100 2×4's, 55 2×6's, and 100 1×4's in stock. Rocking chairs sell for $ 40 and porch swings sell for $ 85. How many pieces of each type of lumber are left over after Jerry has built the number of chairs and swings that maximize his revenue? 23) \_\_\_\_\_\_

A) 5 2×4's, 0 2×6's, and 4 1×4's. B) 0 2×4's, 0 2×6's, and 5 1×4's.

C) 5 2×4's, 0 2×6's, and 0 1×4's. D) 4 2×4's, 0 2×6's, and 5 1×4's.

**Find the indicated probability.**

24) When a single card is drawn from an ordinary 52-card deck, find the probability of getting a red 9 or a red 2. 24) \_\_\_\_\_\_

A) 1/13 B) 1/26 C) ¼ D) 1/52

**Two dice are rolled. Write the indicated event in set notation.**

25) The sum of the dice is multiple of 5. 25) \_\_\_\_\_\_

A) ∅

B) {(1, 5), (2, 5), (3, 5), (4, 5), (5, 5), (6, 5)}

C) {(1, 4), (4, 1), (2, 3), (3, 2), (4, 6), (6, 4), (5, 5)}

D) {(1, 4), (4, 1), (2, 3), (3, 2)}