

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

**Find the probability.**

- 1) A family has five children. The probability of having a girl is  $\frac{1}{2}$ . What is the probability of having at least 3 boys? 1) \_\_\_\_\_  
A) 0.4688                      B) 0.5000                      C) 0.1563                      D) 0.3125
- 2) What is the probability that 13 rolls of a fair die will show three threes? 2) \_\_\_\_\_  
A) 0.1069                      B) 0.4276                      C) 0.2138                      D) 0.0428

**Find the expected value of the random variable.**

- 3) The random variable  $X$  is the number of houses sold by a realtor in a single month at the Sendsom's Real Estate office. Its probability distribution is given in the table. 3) \_\_\_\_\_

$x$	$P(X = x)$
0	0.24
1	0.01
2	0.12
3	0.16
4	0.01
5	0.14
6	0.11
7	0.21

- A) 3.50                      B) 3.40                      C) 3.35                      D) 3.60

**Solve the problem.**

- 4) A contractor is considering a sale that promises a profit of \$34,000 with a probability of .7 or a loss (due to bad weather, strikes, and such) of \$10,000 with a probability of .3. What is the expected profit? 4) \_\_\_\_\_  
A) \$23,800                      B) \$24,000                      C) \$20,800                      D) \$30,800
- 5) Numbers is a game where you bet \$1.00 on any three-digit number from 000 to 999. If your number comes up, you get \$600.00. Find the expected net winnings. 5) \_\_\_\_\_  
A) -\$0.42                      B) -\$1.00                      C) -\$0.50                      D) -\$0.40

**Find the indicated probability.**

6) The age distribution of students at a community college is given below.

6) \_\_\_\_\_

<u>Age (years)</u>	<u>Number of students (f)</u>
Under 21	415
21-25	411
26-30	214
31-35	51
Over 35	30
<hr/>	
	1121

A student from the community college is selected at random. Find the probability that the student is between 26 and 35 inclusive. Round your answer to three decimal places.

- A) 0.236                      B) 0.045                      C) 265                      D) 0.191

**Find the mean of the set of data.**

7) 12, 8, 5, 7, 13

7) \_\_\_\_\_

- A) 9                              B) 10                              C) 46                              D) 11.25

**Find the median.**

8) 3, 5, 19, 24, 38, 38, 45

8) \_\_\_\_\_

- A) 38                              B) 25                              C) 19                              D) 24

**Find the mode or modes.**

9) 5, 9, 74, 3, 2, 8, 86, 1, 4, 16

9) \_\_\_\_\_

- A) 20.2                              B) 8                              C) No mode                              D) 9

**Find the mean for the given frequency distribution.**

10)

10) \_\_\_\_\_

<u>Value</u>	<u>Frequency</u>
14	1
19	6
24	4
29	3
35	2

- A) 24.3                              B) 27.2                              C) 23.8                              D) 7.6

**Find the median for the given frequency distribution.**

11)

11) \_\_\_\_\_

<u>Value</u>	<u>Frequency</u>
20	4
30	6
40	5
50	3
80	1

- A) 44                              B) 30                              C) 35                              D) 40

**Find the range for the set of data given.**

12) 6   16   1   13   11

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

- A) 16                              B) 1                              C) 15                              D) 5

**Find the standard deviation. Round to one more place than the data.**

13) 19, 14, 17, 6, 5, 14, 14, 16, 15

A) 4.7

B) 5.1

C) 1.7

D) 4.5

13) \_\_\_\_\_

**Find the indicated percentile.**

14) The weights (in pounds) of 18 randomly selected adults are given below. Find the twenty-eighth percentile,  $P_{28}$ .

120 165 187 143 119 132

127 156 179 159 180 202

114 146 151 168 173 144

A) 127

B) 132

C) 143

D) 138

14) \_\_\_\_\_

**Find the indicated decile or percentile.**

15) The test scores of 15 students are listed below. Find the third decile,  $D_3$ .

40 46 52 57 61

63 67 70 74 77

85 87 90 94 95

A) 63

B) 56.5

C) 61

D) 57

15) \_\_\_\_\_

**Rank the data from lowest to highest and determine the requested quartile.**

16) The following scores on the midterm exam in Chemistry 102 were recorded.

93 81 59 69 82 74 61 77 95 84 88 71

86 97 63 72 89 80 60 98 91 62 78 83

76 81 94 66 83 96

Find the 3rd quartile,  $Q_3$ .

A) 76

B) 88

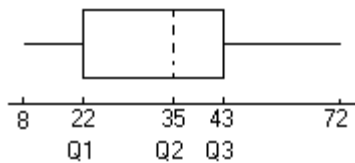
C) 86

D) 89

16) \_\_\_\_\_

**Solve.**

17)



Give the median of the data set represented by the box plot above.

A) 43

B) 35

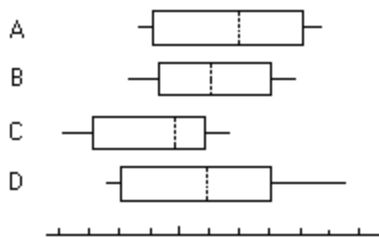
C) 22

D) 37

17) \_\_\_\_\_

18)

18) \_\_\_\_\_



Which box has the highest maximum value?

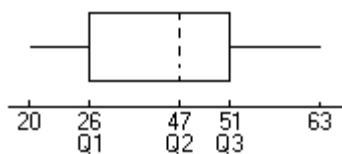
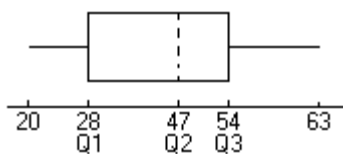
- A) A                      B) B                      C) D                      D) C

19) Construct a box plot from the data below.

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

20 25 26 26 26  
 27 29 33 41 43  
 45 46 47 48 50  
 50 50 51 53 55  
 57 60 61 62 63

- A)    B)



- C)    D)



**Solve the problem.**

20) The low temperature in city S yesterday was 34 degrees. For this month of the year, the average low temperature in city S is 31 degrees with a standard deviation of 7.8 degrees. The low temperature in city W yesterday was 53 degrees. For this month of the year, the average low temperature in city W is 38 with a standard deviation of 6.6 degrees. Find the z-score for each city. Relatively speaking, which city had the more unusual low temperature?

20) \_\_\_\_\_

- A) 0.38, 2.27, city W                      B) 3.0, 15.0, city S  
 C) 3.0, 15.0, city W                      D) 0.38, 2.27, city S

**Use the standard normal curve table to find the closest z-score for the given condition.**

21) 4% of the total area is to the right of z.

21) \_\_\_\_\_

- A) 1.74                      B) 1.75                      C) -1.75                      D) 1.76

**Find the area under the normal curve for the condition.**

- 22) Find the percent of the area under the curve between the mean and 3.01 standard deviations from the mean. 22) \_\_\_\_\_  
A) 99.9%                      B) 49.7%                      C) 49.9%                      D) 50.1%
- 23) Find the percent of the total area under the curve between  $z = 1.41$  and  $z = 2.83$ . 23) \_\_\_\_\_  
A) 7.85%                      B) 7.8%                      C) 7.9%                      D) 7.7%

**At one high school, the mean time for running the 100-yard dash is 15.2 seconds with a standard deviation of 0.9 seconds. The times are very closely approximated by a normal curve. Find the percent of times that are:**

- 24) More than 15.2 seconds 24) \_\_\_\_\_  
A) 48%                      B) 34%                      C) 50%                      D) 68%

**A company installs 5,000 light bulbs. The lifetimes of the lightbulbs are approximately normally distributed with a mean of 500 hours and a standard deviation of 100 hours. Find the approximate number of bulbs that can be expected to last the indicated amount of time.**

- 25) At least 500 hours 25) \_\_\_\_\_  
A) 2,500                      B) 5,000                      C) 1,000                      D) 2,400
- 26) Between 540 hours and 780 hours 26) \_\_\_\_\_  
A) 2,215                      B) 1,717                      C) 2,217                      D) 1,710

**Find the indicated probability or percentage for the normally distributed variable.**

- 27) A machine produces bolts with a mean diameter of 0.30 inches and a standard deviation of 0.01 inches. The diameters are approximately normally distributed. What is the probability that a randomly selected bolt will have a diameter greater than 0.32 inches? 27) \_\_\_\_\_  
A) 0.477                      B) 0.977                      C) 0.046                      D) 0.023

**Solve the problem.**

- 28) Scores on a test are approximately normally distributed with a mean of 70 and a standard deviation of 9. The teacher wants to give A's to the top 10% of students. What is the bottom cutoff for an A grade? Round your answer to the nearest whole number. 28) \_\_\_\_\_  
A) 82                      B) 90                      C) 79                      D) 80
- 29) At Loop College, the mean grade point average (gpa) of the current student body is 2.76 with a standard deviation of 0.64. Find the gpa of a student whose  $z$ -score is 1.8. Round to the nearest hundredth. 29) \_\_\_\_\_  
A) 3.91                      B) 3.40                      C) 2.85                      D) 0.96

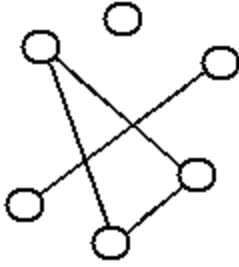
**Use the theorem that relates the sum of degrees to the number of edges to determine the number of edges in the graph.**

- 30) A graph with 5 vertices, one of degree 4, three of degree 3, and one of degree 1. 30) \_\_\_\_\_  
A) 3 edges                      B) 4 edges                      C) 7 edges                      D) 8 edges

Determine how many components the graph has.

31)

31) \_\_\_\_\_



A) 4

B) 2

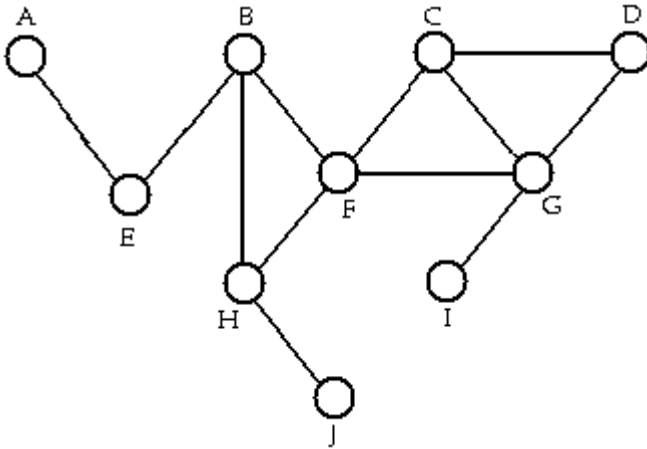
C) 5

D) 3

Determine whether the sequence of vertices is i) a walk, ii) a path, iii) a circuit in the given graph.

32)

32) \_\_\_\_\_



$G \rightarrow F \rightarrow H \rightarrow B \rightarrow F \rightarrow C \rightarrow G$

A) None of these

B) Walk, path, and circuit

C) Walk and path

D) Walk only

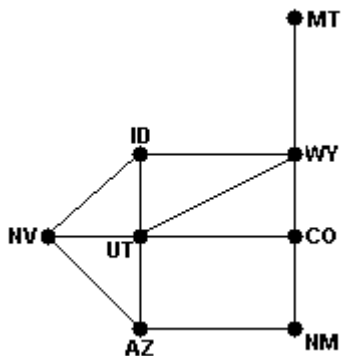
Represent the following with a graph.

33) Which graph below models the bordering relationship among the states shown in the following map? Use vertices to represent the states and edges to represent common borders.

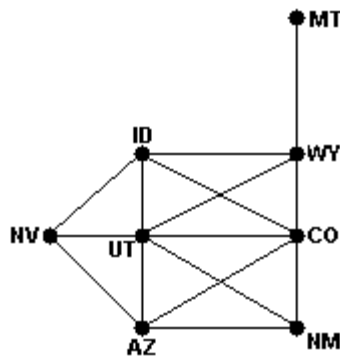
33) \_\_\_\_\_



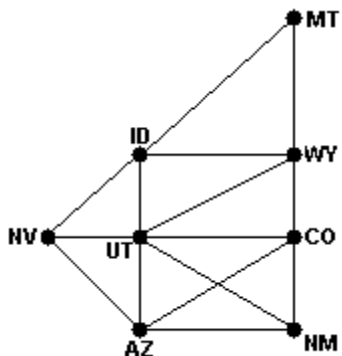
A)



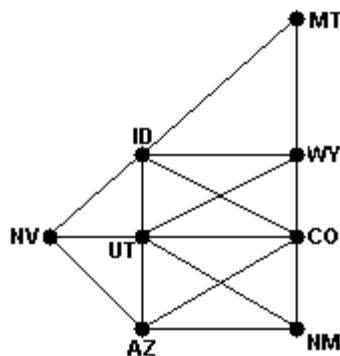
B)



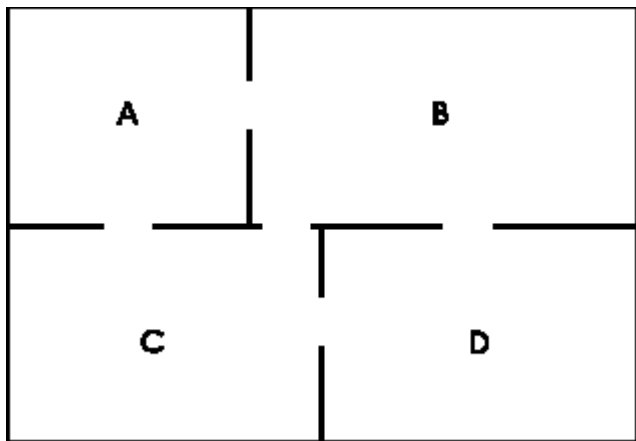
C)



D)

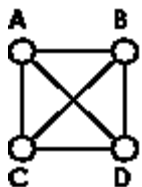


34)

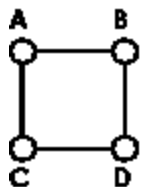


34) \_\_\_\_\_

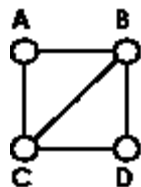
A)



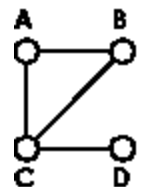
B)



C)



D)



Solve the problem.

35) There are 9 members on a baseball team. At the end of the game, each member of the team shakes hands with each member of the opposing team. How many handshakes occur?

35) \_\_\_\_\_

A) 162

B) 81

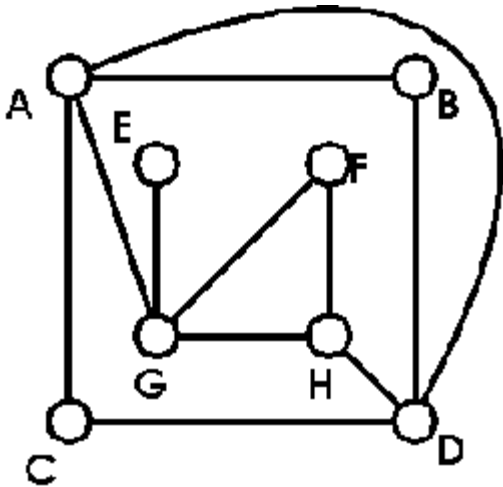
C) 40.5

D) 9

Determine whether the graph has an Euler path that begins and ends at different vertices. If the graph has such a path, say at which vertices the path must begin and end.

36)

36) \_\_\_\_\_

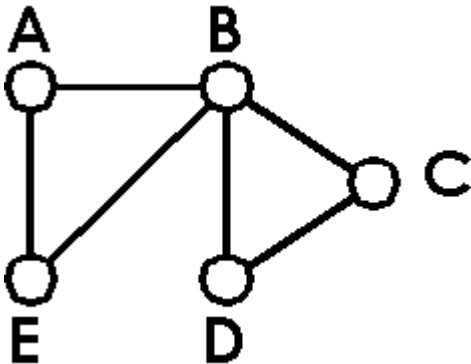


- A) Yes; A and H      B) Yes; E and H      C) No      D) Yes; E and F

Use Fleury's algorithm to find an Euler circuit for the graph beginning and ending at the indicated vertex. If no Euler circuit exists, state this.

37) Using the following graph, find an Euler circuit that begins and ends with vertex A.

37) \_\_\_\_\_



- A) No Euler circuit exists.      B)  $A \rightarrow B \rightarrow C \rightarrow D \rightarrow E \rightarrow A \rightarrow B$   
 C)  $A \rightarrow B \rightarrow C \rightarrow D \rightarrow B \rightarrow E \rightarrow A$       D)  $A \rightarrow B \rightarrow C \rightarrow D \rightarrow B \rightarrow A$

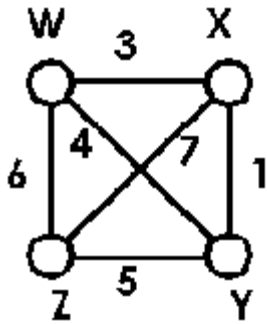




Use the brute force algorithm to find a minimum Hamilton circuit for the graph. Also, determine the total weight of the minimum Hamilton circuit.

41)

41) \_\_\_\_\_

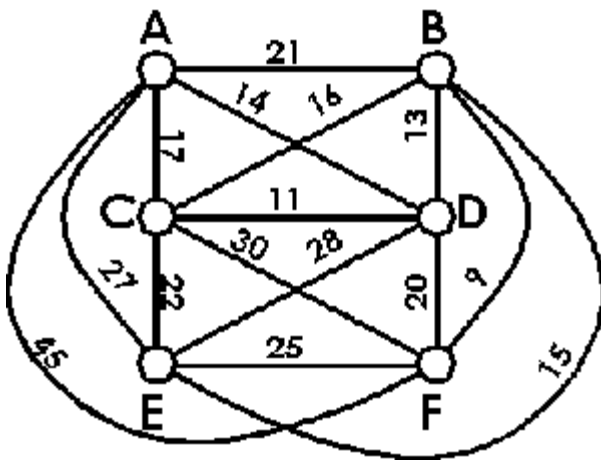


- A) Minimum Hamilton circuit is  $W \rightarrow Z \rightarrow X \rightarrow Y \rightarrow W$ ; weight = 18
- B) Minimum Hamilton circuit is  $W \rightarrow Z \rightarrow Y \rightarrow X \rightarrow W$ ; weight = 14
- C) Minimum Hamilton circuit is  $W \rightarrow X \rightarrow Z \rightarrow Y \rightarrow W$ ; weight = 15
- D) Minimum Hamilton circuit is  $W \rightarrow X \rightarrow Y \rightarrow Z \rightarrow W$ ; weight = 15

For the graph below, use the nearest neighbor algorithm to find an approximate minimum Hamilton circuit and its weight, starting at the indicated vertex.

42)

42) \_\_\_\_\_



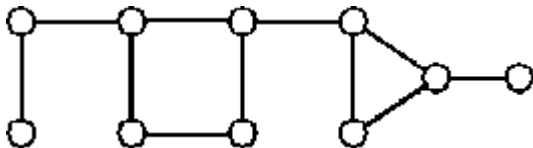
Starting at A

- A)  $A \rightarrow D \rightarrow E \rightarrow B \rightarrow C \rightarrow F \rightarrow A$ ; weight = 102
- B)  $A \rightarrow B \rightarrow C \rightarrow D \rightarrow F \rightarrow E \rightarrow A$ ; weight = 102
- C)  $A \rightarrow D \rightarrow C \rightarrow B \rightarrow E \rightarrow F \rightarrow A$ ; weight = 102
- D)  $A \rightarrow D \rightarrow C \rightarrow B \rightarrow F \rightarrow E \rightarrow A$ ; weight = 102

Determine the number of spanning trees in the graph.

43)

43) \_\_\_\_\_



- A) 12
- B) 13
- C) 15
- D) 16

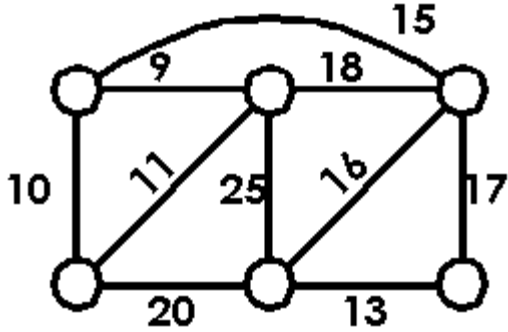
Give an appropriate answer to the question.

44) Suppose we have a spanning tree with 15 edges. Determine the sum of the degrees of the vertices for the spanning tree. 44) \_\_\_\_\_

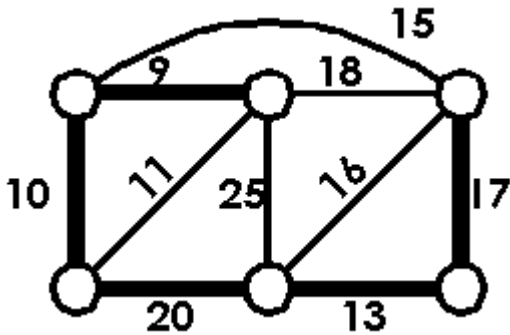
- A) 15                      B) 30                      C) 16                      D) 29

Find a minimum spanning tree for the graph.

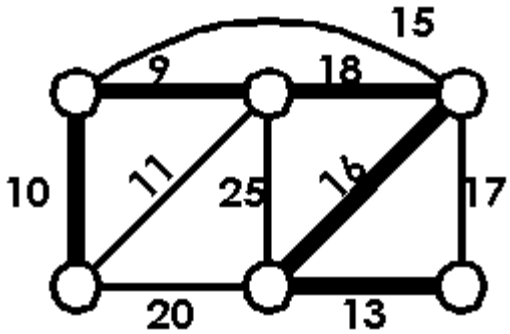
45) \_\_\_\_\_



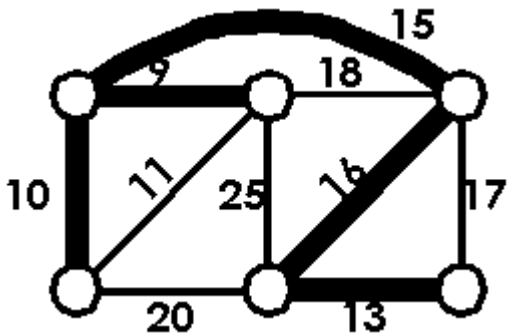
A)



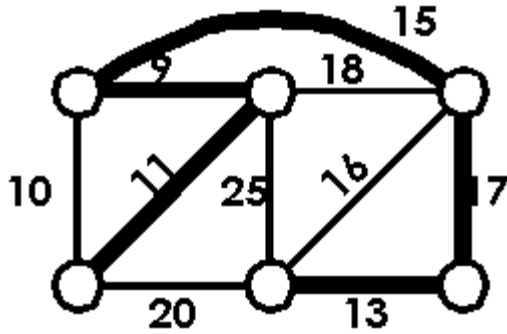
B)



C)



D)



Write a voter profile for the voting situation.

46) Eight voters are asked to rank 3 brands of automobiles: A, B, and C. The eight voters turn in the following ballots showing their preferences in order:

46) \_\_\_\_\_

Voter	#1	#2	#3	#4	#5	#6	#7	#8
1st place	C	B	A	A	C	B	B	A
2nd place	B	C	B	B	B	C	A	B
3rd place	A	A	C	C	A	A	C	C

Write a voter profile for these ballots.

A)

Number of Voters	Ranking
3	A > B > C
2	B > A > C
1	B > C > A
2	C > B > A

B)

Number of Voters	Ranking
3	A > B > C
2	B > A > C
1	B > C > A
2	C > A > B

C)

Number of Voters	Ranking
3	A > B > C
1	B > A > C
2	B > C > A
2	C > B > A

D)

Number of Voters	Ranking
3	A > B > C
1	B > A > C
2	B > C > A
2	C > A > B

Solve the problem.

47) Four members are running for president of the Greater New Orleans Stamp Club: Andy (a), Brett (b), Carol (c), and Denise (d). The voter profile is summarized in the table.

47) \_\_\_\_\_

Number of Voters	Ranking
15	b > a > c > d
11	c > a > d > b
9	d > c > a > b
5	a > d > c > b
1	c > d > a > b

Use the Plurality Method to determine the winner.

A) Brett

B) Denise

C) Carol

D) Andy

- 48) Four members are running for president of the Greater New Orleans Stamp Club: Andy (a), Brett (b), Carol (c), and Denise (d). The voter profile is summarized in the table. 48) \_\_\_\_\_

Number of Voters	Ranking
15	b > a > c > d
11	c > a > d > b
9	d > c > a > b
5	a > d > c > b
1	c > d > a > b

Use the Pairwise Comparison Method to determine the winner.

- A) Denise                      B) Brett                      C) Andy                      D) Carol

- 49) Four members are running for president of the Greater New Orleans Stamp Club: Andy (a), Brett (b), Carol (c), and Denise (d). The voter profile is summarized in the table. 49) \_\_\_\_\_

Number of Voters	Ranking
15	b > a > c > d
11	c > a > d > b
9	d > c > a > b
5	a > d > c > b
1	c > d > a > b

Use the Borda Method to determine the winner.

- A) Andy                      B) Carol                      C) Denise                      D) Brett

- 50) Four members are running for president of the Greater New Orleans Stamp Club: Andy (a), Brett (b), Carol (c), and Denise (d). The voter profile is summarized in the table. 50) \_\_\_\_\_

Number of Voters	Ranking
15	b > a > c > d
11	c > a > d > b
9	d > c > a > b
5	a > d > c > b
1	c > d > a > b

Use the Hare Method to determine the winner.

- A) Andy                      B) Brett                      C) Carol                      D) Denise

## Answer Key

Testname: MATH100-PRACTICETEST3-SPRING2012

- 1) B
- 2) C
- 3) D
- 4) C
- 5) D
- 6) A
- 7) A
- 8) D
- 9) C
- 10) C
- 11) B
- 12) C
- 13) A
- 14) C
- 15) C
- 16) D
- 17) B
- 18) C
- 19) A
- 20) A
- 21) B
- 22) C
- 23) D
- 24) C
- 25) A
- 26) D
- 27) D
- 28) A
- 29) A
- 30) C
- 31) D
- 32) B
- 33) C
- 34) C
- 35) B
- 36) B
- 37) C
- 38) Yes. Answers will vary. One possibility is:  $A \rightarrow B \rightarrow C \rightarrow D \rightarrow E \rightarrow F \rightarrow G \rightarrow H \rightarrow I \rightarrow J \rightarrow B \rightarrow I \rightarrow D \rightarrow H \rightarrow E \rightarrow G \rightarrow J \rightarrow A$
- 39) B
- 40) A
- 41) D
- 42) D
- 43) A
- 44) B
- 45) C
- 46) C
- 47) A
- 48) D
- 49) A

Answer Key

Testname: MATH100-PRACTICETEST3-SPRING2012

50) D