Exam 1 will be on 05/31/12 and cover the following sections: 2.1, 2.2, 2.3, 2.4, 2.5, 12.1, 12.2, 12.3.

**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

### Write the set in set-builder notation.
1) \( \{2, 4, 6, 8\} \)

2) \( \{12, 15, 18, 21, \ldots, 42\} \)

3) \( \{13, 14, 15, 16\} \)

4) \( \{24, 27, 30, 33, \ldots, 54\} \)

5) \( \{12, 15, 18, 21, \ldots, 42\} \)

### Express the set in roster form.
6) \( \{x \mid x \text{ is an integer between 4 and 8}\} \)

7) \( \{x \mid x \text{ is a natural number multiple of 2}\} \)

8) \( \{x \mid x \text{ is a natural number multiple of 5}\} \)

9) The set of the days of the week

10) The set of seasons in a year

### TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

11) \( 16 \not\in \{15, 13, 12, \ldots, 1\} \)

12) \( 8 \in \{16, 24, 32, 40, 48\} \)

13) \( \{6\} = \{x \mid x \text{ is an even counting number between 8 and 14}\} \)

14) \( 7 \not\in \{x \mid x \text{ is an even counting number}\} \)

### SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

**Find \( n(A) \) for the set.**

15) \( A = \{100, 101, 102, \ldots, 1000\} \)

16) \( A = \{x \mid x \text{ is a month in the year}\} \)

17) \( A = \{x \mid x \text{ is a second in a minute}\} \)

18) \( A = \{x \mid x \text{ is a number on a clock face}\} \)
19) \( A = \{1, 3, 5, 7, 9\} \)

20) \( A = \{900, 901, 902, \ldots, 9000\} \)

Determine whether the sets are equal, equivalent, both, or neither.

21) \( \{L, M, N, O\} \) and \( \{l, m, n, o\} \)

22) \( \{100, 41, 18\} \) and \( \{41, 18, 100\} \)

23) \( \{4, 15\} \) and \( \{4, 1, 5\} \)

24) \( \{\text{first, second, third}\} \) and \( \{1, 2, 3\} \)

List all subsets or determine the number of subsets as requested.

25) Determine the number of subsets of \( \{0\} \)

26) Determine the number of subsets of \( \{\text{mom, dad, son, daughter}\} \)

27) Determine the number of subsets of \( \{1, 2, 3, \ldots, 8\} \)

28) List all the subsets of \( \{\text{wolf, hen, pig}\} \).

29) List all the subsets of \( \{7\} \).

30) List all the subsets of \( \{\text{bear, cat, sheep}\} \).

For the given sets, construct a Venn diagram and place the elements in the proper region.

31) Let \( U = \{c, d, g, h, k, u, q\} \)
\( A = \{d, h, g, q\} \)
\( B = \{c, d, h, u\} \)
32) Let $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$
    $A = \{3, 6, 8\}$
    $B = \{4, 6\}$
    $C = \{1, 6, 7, 8\}$

Use the Venn diagram to find the requested set.
33) Find $A \cap B$.

34) Find $(A \cup B)'$.

35) Find $A \cap B'$.

36) Find $A' \cup B$. 

32) $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$
    $A = \{3, 6, 8\}$
    $B = \{4, 6\}$
    $C = \{1, 6, 7, 8\}$

33) $A \cap B$

34) $(A \cup B)'$

35) $A \cap B'$

36) $A' \cup B$
Let $U = \{q, r, s, t, u, v, w, x, y, z\}$
$A = \{q, s, u, w, y\}$
$B = \{q, s, y, z\}$
$C = \{v, w, x, y, z\}$. List the elements in the set.

37) $A \cap (B \cup C)$
38) $C' \cap A'$
39) $A \cup (B \cap C)$
40) $(A \cap B)'$
41) $A \cap B'$
42) $(A \cup B)'$

37) __________
38) __________
39) __________
40) __________
41) __________
42) __________

Use the Venn diagram shown to list the set in roster form.

43) $B$
44) $A \cap C$
45) $(A \cup B)'$
46) $(A \cap B)'$

43) __________
44) __________
45) __________
46) __________

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

Let $A = \{1, 3, 5, 7\}$
$B = \{5, 6, 7, 8\}$
$C = \{5, 8\}$
$D = \{2, 5, 8\}$
$U = \{1, 2, 3, 4, 5, 6, 7, 8\}$.

Determine whether the statement is true or false.

47) $C \subseteq D$
48) $A \not\subseteq A$

47) _____
48) _____
49) \{5\} \subseteq D 

50) C \subseteq A 

51) \{\} \subseteq C 

Solve the problem.

52) Results of a survey of fifty students indicate that 30 like red jelly beans, 29 like green jelly beans, and 17 like both red and green jelly beans. How many of the students surveyed like neither red nor green jelly beans? 

53) Mrs. Bollo’s second grade class of thirty students conducted a pet ownership survey. Results of the survey indicate that 8 students own a cat, 15 students own a dog, and 5 students own both a cat and a dog. How many of the students surveyed own a cat or a dog? 

54) Monticello residents were surveyed concerning their preferences for candidates Moore and Allen in an upcoming election. Of the 800 respondents, 300 support neither Moore nor Allen, 100 support both Moore and Allen, and 250 support only Moore. How many residents support Moore or Allen? 

55) A survey of a group of 111 tourists was taken in St. Louis. The survey showed the following: 

- 62 of the tourists plan to visit Gateway Arch;  
- 45 plan to visit the zoo;  
- 9 plan to visit the Art Museum and the zoo, but not the Gateway Arch;  
- 14 plan to visit the Art Museum and the Gateway Arch, but not the zoo;  
- 17 plan to visit the Gateway Arch and the zoo, but not the Art Museum;  
- 7 plan to visit the Art Museum, the zoo, and the Gateway Arch;  
- 14 plan to visit none of the three places. 

How many plan to visit the Art Museum only? 

56) A survey of 134 college students was done to find out what elective courses they were taking. Let \(A\) = the set of those taking art, \(B\) = the set of those taking basketweaving, and \(C\) = the set of those taking canoeing. The study revealed the following information. 

\[
\begin{align*}
n(A) &= 45 \\
n(B) &= 55 \\
n(C) &= 40 \\
n(A \cap B) &= 12 \\
n(A \cap C) &= 15 \\
n(B \cap C) &= 23 \\
n(A \cap B \cap C) &= 2 
\end{align*}
\]

How many students were not taking any of these electives?
57) 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 500 responses with the following results:

150 were interested in an interview show and a documentary, but not reruns.
20 were interested in an interview show and reruns but not a documentary
70 were interested in reruns but not an interview show.
120 were interested in a documentary and reruns.
30 were interested in an interview show and reruns.
40 were interested in none of the three.

How many are interested in exactly one kind of show?

Construct a frequency distribution for the given qualitative data.
58) The blood types for 40 people who agreed to participate in a medical study were as follows.

O A A O O AB O B A O
A O A B O O O AB A A
A B O A A O O B O O
O A O O A B O O A AB

Construct a frequency distribution for the data.

Construct the requested grouped-data table. Use classes based on a single value.
59) The following data represent the total number of years of formal education for 40 employees of a bank.

| 13 17 13 14 12 17 19 13 15 13 |
| 16 18 13 11 19 12 14 13 13 14 |
| 14 15 13 15 17 18 17 14 13 17 |
| 12 17 17 16 17 15 13 13 14 |

Construct a grouped-data table for the number of years of education.

60) A teacher asked each of her students how many novels they had read in the previous six months. The results are shown below.

| 0 1 5 4 2 1 3 2 |
| 2 7 2 5 0 1 0 1 |
| 1 2 6 0 2 3 1 2 |
| 7 1 4 2 3 1 7 0 |
| 0 2 1 1 0 6 1 7 |

Construct a grouped-data table for the number of novels read.
Construct the requested histogram.

61) The table gives the frequency distribution for the number of television sets per household for a sample of 100 U.S. households.

<table>
<thead>
<tr>
<th># of TVs</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

Construct a relative frequency histogram.

62) The table gives the frequency distribution for the number of radios per household for a sample of 80 U.S. households.

<table>
<thead>
<tr>
<th># of TVs</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

Construct a relative frequency histogram.
Find the mean for the list of numbers.

63) 5, 6, 9, 4, 12, 10 (Round to the nearest tenth) 63) __________

64) 10, 43, 95, 29, 117, 76 (Round to the nearest tenth) 64) __________

65) 11.400, 13.017, 5.161, 3.176, 7.080 (Round to the nearest thousandth) 65) __________

66) 6.57, 13.30, 18.51, 5.46, 7.74, 7.56, 4.12, 11.08 (Round to the nearest hundredth) 66) __________

Find the median.

67) 7, 5, 25, 14, 46, 42, 37 67) __________

68) 10, 10, 22, 24, 35, 39 68) __________

69) 1, 1, 28, 18, 25, 43, 39, 32 69) __________

Find the mode or modes.

70) 20, 31, 46, 31, 49, 31, 49 70) __________

71) 88, 73, 32, 73, 29, 88 71) __________

72) 77, 25, 77, 13, 25, 29, 56, 77 72) __________

Solve the problem. Round to the nearest hundredth, if necessary.

73) The following data gives the number of applicants that applied for a job at a given company each month of 1999: 64, 68, 95, 77, 78, 84, 87, 88, 90, 95, 72, 64. What is the mode of the data? 73) __________

74) The following data gives the number of applicants that applied for a job at a given company each month of 1999: 65, 68, 92, 77, 78, 84, 86, 89, 91, 92, 74, 65. What is the mean of the data? 74) __________

75) The following data gives the number of applicants that applied for a job at a given company each month of 1999: 62, 70, 68, 75, 84, 78, 80, 86, 81, 68, 66, 62. What is the median of the data? 75) __________

Find the standard deviation.

76) 56, 52, 20, 55, 76, 82, 55, 29, 75 76) __________

77) 258, 224, 163, 145, 176, 181, 235, 179, 136 77) __________

78) 18, 10, 16, 11, 8, 13, 19, 16, 9, 24 78) __________

79) 5, 4, 19, 10, 7, 6, 13, 17, 16 79) __________
Find the standard deviation for the given data.

80) Christine is currently taking college astronomy. The instructor often gives quizzes. On the past seven quizzes, Christine got the following scores:
   48 11 38.0 20 19 43 63
   Round results to one decimal place.

81) The manager of a small dry cleaner employs six people. As part of their personnel file, she asked each one to record to the nearest one-tenth of a mile the distance they travel one way from home to work. The six distances are listed below:
   16.5 14.2 46.1 28.7 18.5 11.6
   Round results to two decimal places.

82) To get the best deal on a CD player, Tom called eight appliance stores and asked the cost of a specific model. The prices he was quoted are listed below:
   $182 $304 $183 $304 $149 $298 $335 $297
   Round results to the nearest ten cents.

Find the range for the set of data numbers.

83) 29, 31, 19, 45, 56
84) 112, 457, 129, 604, 407, 335
85) 76, 146, 39, 117, 162
1) \( \{ x \mid x \text{ is an even natural number less than 10} \} \)
2) \( \{ x \mid x \text{ is a multiple of 3 between 9 and 45} \} \)
3) \( \{ x \mid x \text{ is an integer between 12 and 17} \} \)
4) \( \{ x \mid x \text{ is a multiple of 3 between 21 and 57} \} \)
5) \( \{ x \mid x \text{ is a multiple of 3 between 9 and 45} \} \)
6) \( \{ 5, 6, 7 \} \)
7) \( \{ 2, 4, 6, \ldots \} \)
8) \( \{ 5, 10, 15, \ldots \} \)
9) \( \{ \text{Friday, Monday, Saturday, Sunday, Thursday; Tuesday, Wednesday} \} \)
10) \( \{ \text{winter, spring, summer, fall} \} \)
11) TRUE
12) FALSE
13) FALSE
14) TRUE
15) \( n(A) = 901 \)
16) \( n(A) = 12 \)
17) \( n(A) = 60 \)
18) \( n(A) = 12 \)
19) \( n(A) = 5 \)
20) \( n(A) = 8101 \)
21) Equivalent
22) Both
23) Neither
24) Equivalent
25) 2
26) 16
27) 256
28) \( \{ \text{wolf, hen, pig} \}, \{ \text{wolf, hen} \}, \{ \text{wolf, pig} \}, \{ \text{hen, pig} \}, \{ \text{wolf} \}, \{ \text{hen} \}, \{ \text{pig} \}, \{ \} \) \)
29) \( \{ 7 \}, \{ \} \)
30) \( \{ \text{bear, cat, sheep} \}, \{ \text{bear, cat} \}, \{ \text{bear, sheep} \}, \{ \text{cat, sheep} \}, \{ \text{bear} \}, \{ \text{cat} \}, \{ \text{sheep} \}, \{ \} \) \)
31) \[
\begin{array}{ccc}
\text{u} & & \text{c} \\
\text{g} & \text{a} & \text{h} \\
\text{k} & & \text{b}
\end{array}
\]
32) \[
\begin{array}{ccc}
\text{u} & & \\
\text{3} & 6 & 4 \\
1 & 8 & 7 \\
2 & 5 &
\end{array}
\]
33) \( \{ b, h \} \)
34) \( \emptyset \)
35) \( \{<, \%\} \)
36) \( \{Y, Q, \#, F, +\} \)
37) \( \{q, s, w, y\} \)
38) \( \{r, t\} \)
39) \( \{q, s, u, w, y, z\} \)
40) \( \{r, t, u, v, w, x, z\} \)
41) \( \{u, w\} \)
42) \( \{r, t, v, x\} \)
43) \( \{4, 7, 11, 12, 14\} \)
44) \( \{11, 13\} \)
45) \( \{1, 2, 5, 8, 10\} \)
46) \( \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14\} \)
47) TRUE
48) TRUE
49) TRUE
50) FALSE
51) TRUE
52) 8
53) 18
54) 500
55) 14
56) 42
57) 240

58) **Blood type** | **Frequency**
---|---
O | 19
A | 13
B | 5
AB | 3

59) **Number of years of education** | **Frequency**
---|---
11 | 1
12 | 3
13 | 11
14 | 5
15 | 4
16 | 3
17 | 8
18 | 2
19 | 3
### 60) Number of novels vs. Frequency

<table>
<thead>
<tr>
<th>Number of novels</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
</tr>
</tbody>
</table>

### 61) Histogram

![Histogram](image)

### 62) Probabilities

<table>
<thead>
<tr>
<th>Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.625</td>
</tr>
<tr>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>3</td>
<td>0.375</td>
</tr>
<tr>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>5</td>
<td>0.125</td>
</tr>
</tbody>
</table>

### 63) 7.7

### 64) 61.7

### 65) 7.967

### 66) 9.29

### 67) 25

### 68) 23

### 69) 26.5

### 70) 31

### 71) 88, 73

### 72) 77
Answer Key
Testname: MGF_1106_SUMMER_C_EXAM_1_REVIEW

73) 95 and 64
74) 80.08
75) 72.5
76) 20.9
77) 41.6
78) 5.1
79) 5.7
80) 18.6
81) 12.92
82) $72.30
83) 37
84) 492
85) 123