MGF 1106  Test 1 Review

I. You will need to have your own calculator for the test. You may not share calculators or use any type of
communication device in place of a calculator. Tests may not be made up for any reason other than a mandatory school –
sponsored activity for which you must miss class. If you miss one test for any other reason, your final exam score will be
substituted for that test. A second missed test is a zero. No homework bonuses are awarded on a test when the final exam
is substituted or you receive a zero on a missed test.

II. The following topics will be on the exam. The order of the questions will be scrambled.

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<th>Objective</th>
<th>Section</th>
<th>Suggested Text Problems</th>
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<td>2) Use deductive reasoning.</td>
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<td>Answer to b: ( n )</td>
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<td>3) Round numbers.</td>
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<td>4) Work cost comparison problems.</td>
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<td>5) Work coin combination problems</td>
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<td>6) Work problems involving runners in a race.</td>
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<td>7) Use the symbols ( \in ) and ( \notin ).</td>
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<td>8) Find the cardinality of a set.</td>
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<td>9) Answer True/False Questions about subsets.</td>
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<td>10) List all the subsets of a given set.</td>
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<td>11) Find the number of subsets and/or the number of proper subsets of a set.</td>
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<td>12) Find the complement of a set.</td>
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<td>13) Perform operations on two sets.</td>
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<td>14) Use a Venn diagram to answer questions about a set.</td>
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<td>15) Place items in a Venn diagram.</td>
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<td>16) Work survey problems.</td>
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<td>17) Use a Venn diagram to answer questions about a survey.</td>
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<td>18) Negate quantified statements.</td>
<td>3.1</td>
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<td>19) Translate a compound statement to symbolic form.</td>
<td>3.2</td>
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<td>20) Translate symbolic form to a compound statement.</td>
<td>3.2</td>
<td>Page 207: 3</td>
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III. To study for the test:
1. Complete all assigned homework. Remember that a score of at least 80% on each assignment
gives you 10 bonus points on the test.
2. Complete the practice test (on the next page) and be prepared to go over it in class.
3. Set up a study system (note cards for example) for each of the 20 objectives in the chart above.
4. Review your notes and applicable problem set questions for each of the 20 objectives in the chart
above.
5. Work the suggested text problems for each of the 20 objectives in the chart above.
6. Be sure you know the vocabulary listed in the Test 1 Vocabulary Handout. Some vocabulary
questions will be on the exam.
MGF 1106 Test 1 Practice

1) Identify a pattern in the list of numbers. Describe the pattern. Then use this pattern to find the next number.
   a) 7, 10, 13, 16, ?
   b) 7, 14, 28, 56, ?
   c) 2, 6, 12, 36, 72, 216, ?

2) Select a number. Multiply it by 6. Subtract 8 from the product. Divide the difference by 2. Add four to the quotient.
   a) Repeat this process for the numbers 1, 2, 5, 10.
   b) Write a conjecture that relates the result of this process to the original number selected.
   c) Let \( n \) represent the original number. Use deductive reasoning to prove your conjecture.

3) Round 7.899157 to the nearest
   a) tenths
   b) thousandths
   c) hundred-thousandths

4) John has a vending route. He's paid $450 per week to service the vending machines. Kent's company pays him $1750 per month to do the same job. In a single year, who makes more money? What is the difference between the two annual salaries? Assume 12 months in a year and 52 weeks in a year.

5) If you spend $9.74, in how many ways can you receive change from a ten-dollar bill. Use a table and show all possibilities.

6) Trent, Riley, Susan, Doug, and Betty competed in a race. Betty finished 11 seconds after Doug. Betty finished 24 seconds after Riley. Susan finished 8 seconds after Riley. Doug finished 18 seconds before Trent. In which order did the runners finish the race? How many seconds difference was there between first and last place?

7) Use the symbols \( \in \) and \( \notin \) to make the statement true.
   a) 3 \( \in \) \{3, 4, 5, 6\}
   b) \{7\} \( \ni \) \{x \in \mathbb{N} \text{ and } 3 \leq x < 9\}
   c) 9 \( \notin \) \{x \in \mathbb{N} \text{ and } 3 \leq x < 9\}

8) Find the cardinal number for each set.
   a) \{x|x \in \mathbb{N} \text{ and } 3 \leq x < 9\}
   b) \{x|x \text{ is a letter in the word "letter"}\}

9) Determine if each statement is true or false.
   a) \{1, 2\} \subseteq \{0, 1, 2, 3, 4, 5\}
   b) \{1, 2, 3\} \subseteq \{x \in \mathbb{N} \text{ and } 0 < x \leq 3\}
   c) \{\}\subseteq \{1, 2, 3\}
   d) 1 \nsubseteq \{1, 2, 3, 4\}
10) List the subsets of \{cake, pie, cookie\}

11) Suppose S is the set \{winter, spring, summer, fall\}. How many subsets does S have? How many proper subsets does S have?

12) Suppose \(U = \{a, b, c, d, e, f, g, h, i, j\}\) \(A = \{a, b, c, d, h, i, j\}\) \(B = \{b, c, d, f, g, h, j\}\) Find \(A'\) Find \(B'\).

13) Suppose \(U = \{a, b, c, d, e, f, g, h, i, j\}\) \(A = \{a, b, c, d, h, i, j\}\) \(B = \{b, c, d, f, g, h, j\}\). Find the following.
   a) \(A \cap B\)           b) \(A \cup B\)           c) \(A' \cap B\)           d) \(A' \cup B'\)'

14) Jacob was preparing to pack for college. He called his future roommate Marcus to ask if he had purchased certain items. He put the outcome of that phone conversation in the Venn diagram below. What is the set of items that Jacob purchased but not Marcus?
15) Suppose A represents the set of letters in the word “canned”. Set B represents the set of letters in the word “processed”. Set C represents the set of letters in the word “organic”. In what region would you place the letter “e”?

16) A survey of 180 high school students was taken to determine participation in various college activities. 43 were in a service club. 52 were in the band. 35 were on an athletic team. 13 were in a service club and the band. 14 were in the band and on an athletic team. 12 were in a service club and an athletic team. Five students participated in all three activities. Construct a Venn diagram of the survey results and answer the following questions.
   a) How many participated in band but were not on an athletic team?
   b) How many students participated in exactly one activity?
   c) How many students participated in exactly two activities?

17) Pete’s Pet Shop surveyed dog owners to find out if they gave their pets canned dog food or pet treats. The results of the survey are summarized in the Venn diagram below. How many dog owners gave their pets canned dog food and pet treats?
18) Negate each statement.
   a) All whales are mammals.  
   b) No blue clouds are in the sky. 
   c) Some pianists are not proficient.  
   d) Some children like video games.  

19) Let $p, q, r$ represent the following statements.
   p: Jim likes oranges  
   q: Mike likes strawberries  
   r: Katie likes mangoes  
   Translate each statement to symbolic form.
   a) Jim likes oranges and Katie does not like mangoes.  
   b) Katie likes mangoes if and only if Mike likes strawberries.  
   c) If Jim does not like oranges, then Mike likes strawberries or Katie does not like mangoes. 

20) Let $p, q, r$ represent the statements in question 19. Translate each symbolic form to English.
   a) $p \lor q$  
   b) $q \land (\neg p \rightarrow \neg r)$