Universidad de Puerto Rico
Departamento de Matemáticas
MATE 3023 Repaso I, Conjuntos

Apellidos: _____   Nombre: _____

No. Estudiante: _____   Sección: _____

Instrucciones: Lea cuidadosamente todos los ejercicios. El procedimiento debe aparecer en el repaso para obtener crédito parcial o total.

1) Si $A = \{x \in \mathbf{R} \mid -3 < x < 2\}, B = \{x \in \mathbf{R} \mid -1 < x \le 3\}$, halla y traza la gráfica:

  a) $A \cap B$

  b) $(A \cup B)'$

  c) $A' \cup B'$

  d) $A' \cap B'$

  e) $(A \cap B)'$

2) Si $A = \{x \in \mathbb{N} \mid x \text{ es múltiplo de } 3\}$ y $B = \{x \in \mathbb{N} \mid x \text{ es múltiplo de } 5\}$

  halla $A \cap B$

Venn Diagram Problems

1. In a group of students registering for math
   a) 20 registered because they found math fun
   b) 28 registered because they found math challenging
   c) 32 registered because they found math useful
   d) 11 registered because they found math challenging and useful
   e) 2 registered because they found math fun, challenging, and useful
   f) 8 registered because they found math fun and either useful or challenging
   g) 7 registered because they found math fun and useful

   a) Completely label and fill in a three-set Venn diagram for the above scenario.
   b) How many students registered because they
      i) just found math challenging?
      ii) just found math fun?
      iii) just found math useful?

2. There are 120 students from which
   - 54 listen to Rock
   - 40 listen to Country
   - 40 listen to Alternative
   - 12 listen to Country & Rock
   - 10 listen to Country & Alternative
   - 16 listen to Rock & Alternative
   - 7 listen to all 3
   a) Completely label and fill in a three-set Venn diagram of the above scenario.
   b) How many listen to only Rock & Country?
   c) How many don't listen to any of the three?

3. From 100 pet owners
   - 56 owned fish
   - 35 owned dogs
   - 29 owned cats
   - 12 owned none of the above
   - 14 owned dogs & fish.
   - No one owned all three.
   - 16 owned cats & fish.
   a) How many people owned cats & dogs?
   b) How many people owned just fish?

4. In a survey of children who saw three different shows at Walt Disney World, the following information was gathered:

- 39 children liked *The Little Mermaid*

- 43 children liked *101 Dalmatians*

- 56 children liked *Mickey Mouse*

- 7 children liked *The Little Mermaid* and *101 Dalmatians*

- 10 children liked *The Little Mermaid* and *Mickey Mouse*

- 16 children liked *101 Dalmatians* and *Mickey Mouse*

- 4 children liked *The Little Mermaid*, *101 Dalmatians*, and *Mickey Mouse*

- 6 children did not like any of the shows

 a) How many students were surveyed?

 b) How many liked *The Little Mermaid* only?

 c) How many liked *101 Dalmatians* only?

 d) How many liked *Mickey Mouse* only?

5. In a certain group of football players:
- 60 played for Packers
- 40 played for Lions
- 35 played for Bears
- 20 played for Packers & Lions
- 15 played for Lions & Bears
- 12 played for Packers & Bears
- 3 played for all three
- 3 didn't play for any of the three

 How many players are there altogether in this group?

At the site http://www.rwc.uc.edu/koehler/comath/java/venn.html, there are the following instructions for manipulating a java applet on Venn diagrams. Use this applet to practice the various set operations. Please note that "+" is used for "$\cup$", "&" for "$\cap$", and A' for ~ A.

The applet below creates problems for you to practice using Venn diagrams. You will be given a set theoretical expression in three sets, and asked to color in the Venn diagram to correctly represent the expression. When you have computed your answer, click in the various regions of the diagram to "color" in the diagram, and then click on the "Check Answer" button to find out if you did the problem correctly. The "Start Over" button will clear the diagram and the "Next Problem" button will generate another expression for you to practice with.