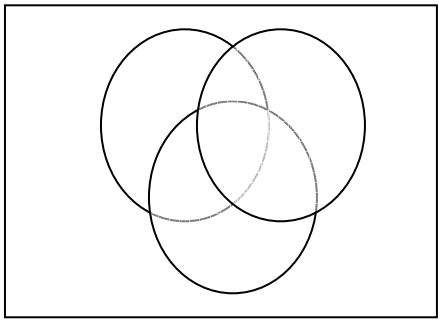
Math 100 Name _____
Fall, 2008

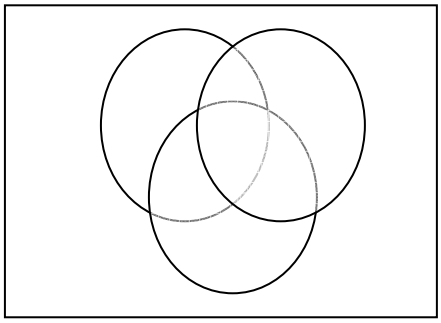
Homework #4
Due Monday, September 15
No late papers accepted! No excuses!

Shade each of the following sets in a Venn diagram.

1. $(A' \cap B) \cap C'$



2. $A \cap (B \cap C)'$



3. Let U = {s, t, u, v, w, x, y, z }, A = {s, v, y, z}, B = {u, v, w, x}, and C = {x, y, z}. Find each of the following.
   a) B′
   b) C ∪ (∅ ∩ B)
   c) A ∩ (B′ ∪ C)
   d) (A ∩ B) ∪ C
   e) (A ∩ C)′
   f) A′ ∩ (B ∪ C)

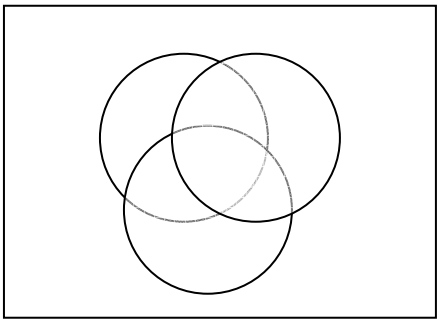
4. In a recent survey of 100 women, the following information was gathered.

59 use Shampoo A
51 use Shampoo B
35 use Shampoo C
24 use Shampoos A and B
19 use Shampoos A and C
13 use Shampoos B and C
11 use all three

a) Construct a Venn diagram to model the above problem.

Use your model to answer the following questions

b) How many women like Shampoo A only?
c) How many women like Shampoo A and B but not C?
d) How many women like Shampoo A or B but not C?
e) How many women do not like any of the three shampoos?
f) How many women like Shampoo B or C?
g) How many women like Shampoo B and C?
h) How many women like at least two of these shampoos?
i) How many women like at most one of these shampoos?



5. Given that set A has 16 elements, set B has 12 elements, and set C has 7 elements.
   a) What is the maximum possible number of elements in $A \cup B \cup C$?

   b) What is the minimum possible number of elements in $A \cup B \cup C$?

   c) What is the maximum possible number of elements in $A \cap (B \cup C)$?

   d) What is the minimum possible number of elements in $A \cap (B \cup C)$?

5.