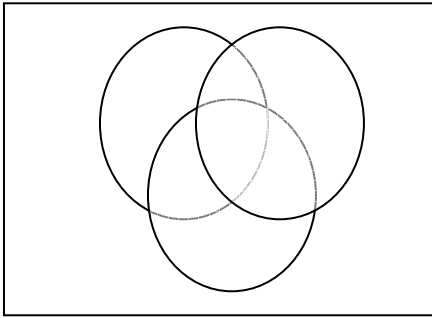


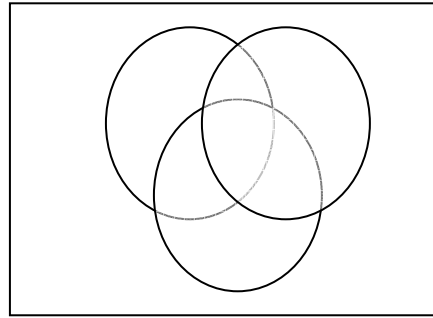
Homework #4
Due Thursday, September 11
No late papers accepted! No excuses!

Shade each of the following sets in a Venn diagram.

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



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



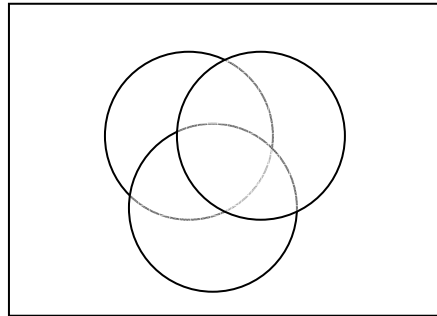
3. Let $U = \{s, t, u, v, w, x, y, z\}$, $A = \{s, v, y, z\}$, $B = \{u, v, w, x\}$, and $C = \{x, y, z\}$.
Find each of the following.

- B'
- $C \cup (\emptyset \cap B)$
- $A \cap (B' \cup C)$
- $(A \cap B) \cup C$
- $(A \cap C)'$
- $A' \cap (B \cup C)$

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