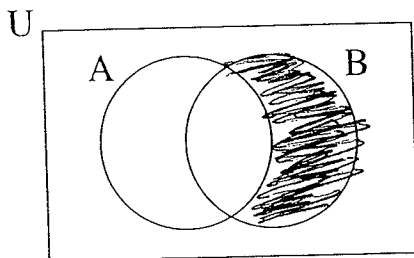


Name SOLUTIONS

(circle your lab section)

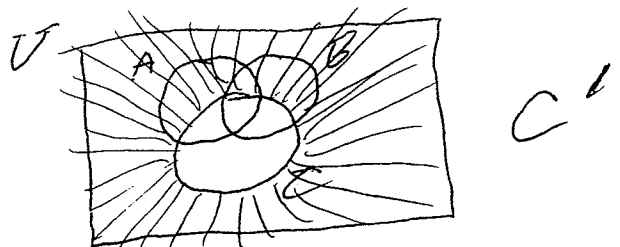
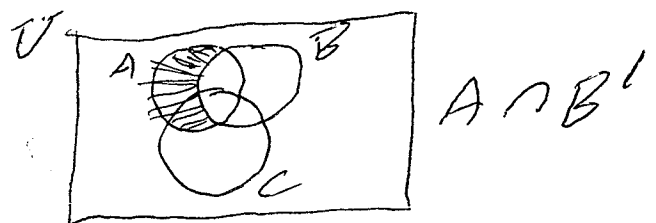
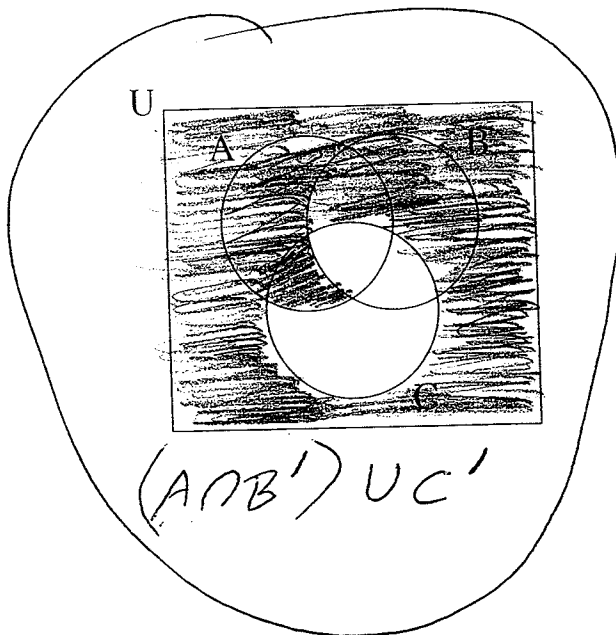
- ▷ AB1, Fri 11:00-12:40, Brian Benson
- ▷ AB2, Thu 3:00-4:40, Paul Spiegelhalter
- ▷ AB3, Thu 1:00-2:40, Brian Benson
- ▷ AB4, Fri 1:00-2:40, Paul Spiegelhalter

1. (2 points) Use set notation to identify the shaded region shown in the Venn diagram below.



$B \setminus A$   
or  
 $B \cap A'$

2. (2 points) Using the Venn diagram below, shade in the portion which represents the set  $(A \cap B') \cup C'$ .



3. (2 points) Given the universal set  $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$  and sets  $A = \{4, 5, 6\}$ ,  $B = \{1, 2, 3, 4\}$ , and  $C = \{3, 4, 5, 6, 7, 8\}$ , determine  $(A \cup B)' \cap C$ .

$$A \cup B = \{1, 2, 3, 4, 5, 6\}$$

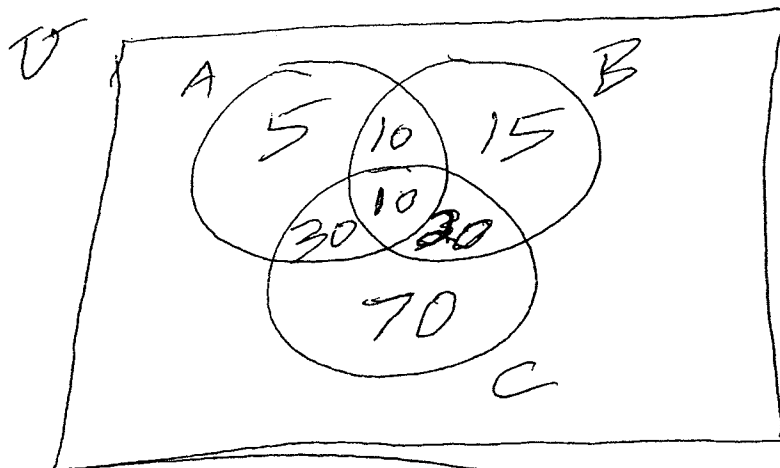
$$(A \cup B)' = \{7, 8, 9\}$$

$$(A \cup B)' \cap C = \{7, 8\}$$

4. (2 points) De Morgan's laws state that  $(A \cup B \cup C)'$  is equivalent to what other set?

$$A' \cap B' \cap C'$$

5. (2 points) A survey of 200 children was taken to determine if they liked asparagus, broccoli, or carrots. 55 children liked asparagus, 55 liked broccoli, and 130 liked carrots. Furthermore 20 children liked asparagus and broccoli, 40 liked asparagus and carrots, and 30 liked broccoli and carrots. Finally, 10 children liked all three vegetables. How many of the children surveyed did not like any of these three vegetables?



$$5 + 10 + 15 + 30 + 10 + 20 + 70 = 160$$

50 children did not like any vegetable

MORE FORMALLY,

$$\begin{aligned} |A \cup B \cup C| &= |A| + |B| + |C| - |A \cap B| - |A \cap C| - |B \cap C| + |A \cap B \cap C| \\ &= 55 + 55 + 130 - 20 - 40 - 30 + 10 \\ &= 160 \end{aligned}$$

$$\text{So } |(A \cup B \cup C)'| = 40$$