

# Week in Review # 6

MATH 141

Drost-Spring 2010

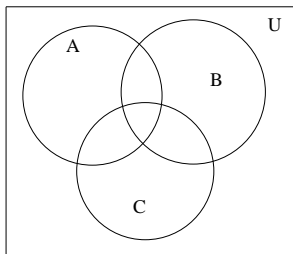
6.1, 6.2, 6.3, 6.4

1. Write each set with roster notation:

a)  $A = \{x | x \in I, 2x - 4 > 3\}$

b)  $B = \{x | x \text{ is a state west of California} \}$

2. Shade the region described below:



a)  $A \cap (B \cup C)$

b)  $B^c \cap A$

c)  $(A \cap B \cap C)^c$

3. Describe each of the following:

$U = \{\text{students enrolled in this class}\}$

$A = \{\text{students who play bridge}\}$

$B = \{\text{students who live in dorms}\}$

$C = \{\text{students who drive an SUV}\}$

a)  $A \cap C$

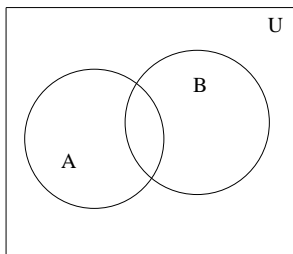
b)  $B^c \cup A$

c)  $C^c \cap B$

4. Given A and B are subsets of U,

$n(U) = 250, n(A) = 90, n(B) = 165,$

$n(A \cap B) = 25,$  find each of the following.



a)  $n(A \cup B)$

b)  $n(A^c)$

c)  $n(A^c \cup B^c)$

5. A poll of 200 shoppers found the following:

60 carried an American Express card

60 carried a Bank Americard

95 had Aggie Bucks

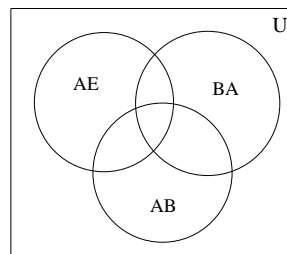
55 had at least two of these

20 had Bank Americard and Aggie Bucks

125 had American Express or Aggie Bucks

140 did not have American Express

105 had American Express or Bank Americard



a) how many shoppers carried all three cards?

b) how many had none of the three?

c) how many had only one card?

6. A box contains five biographies, four mysteries, and six children's books.

a) How many ways can these books be arranged on a shelf?

b) How many ways can these books be arranged if the biographies, mysteries and children's books are kept together?

7. How many different committees can be formed if it is composed of two faculty members and ten students, given that five faculty have applied and thirty students applied?

8. How many different arrangements are possible with the letters of the word: S U C C E S S

9. A box contains two red marbles, three blue marbles, and five black marbles. How many ways can you select one red, two blue and three black marbles? Each of the marbles has a different letter of the alphabet painted on its surface.

10. A shipment arrives of 500 batteries, 20 of which are defective. A sample of ten is selected at random.

a) In how many different ways can the samples be selected?

b) How many samples contain six defective batteries?

c) How many samples contain no defective batteries?

11. Given  $U = \{1, 2, 3, 4, 5\}$ ,  $A = \{2, 4, 5\}$ , and  $B = \{4, 5\}$

Label each of the following as True or false:

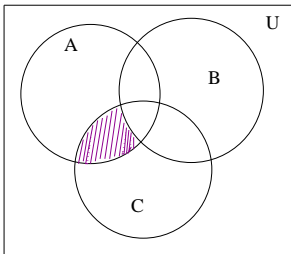
- a.  $4 \subseteq A$
- b.  $B \subseteq A$
- c.  $\phi \subseteq A$
- d.  $5 \in A$
- e.  $5 \in B^C$

Find the elements in each of the following:

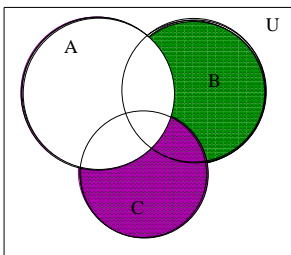
- f.  $A \cup B$
- g.  $A \cup B^C$
- h.  $A^C \cap B^C$

Describe the shaded regions below:

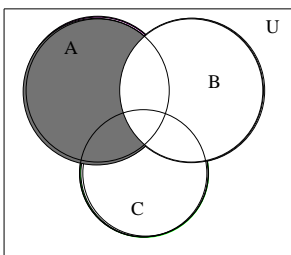
i.



j.



k.

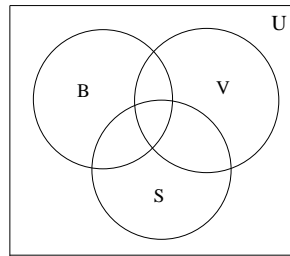


12. Given  $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$ ,  $A = \{2, 4, 6, 8\}$ ,  $B = \{1, 2, 3, 4\}$

- a. list all the proper subsets of A
- b. find  $n(A \cap B^C)$
- c. true or false:  $A = B$
- d. true or false:  $n(A) = n(B)$
- e. find:  $N(A^C \cap B)$

13. Of the 50 students at Midtown School, there were:

- 27 who played basketball
- 19 who played volleyball
- 15 who played soccer
- 8 who played basketball and volleyball
- 7 who played volleyball and soccer
- 2 who played basketball and soccer only
- 1 who played volleyball, basketball and soccer.



- a) How many played only volleyball and soccer?
- b) How many played only one sport?
- c) How many played at least two sports?
- d) How many did not play in these sports?

ANSWERS:

- 1a.  $A = \{4, 5, 6, 7, \dots\}$
- 1b.  $B = \{\text{Hawaii, Alaska}\}$
- 2a. regions b, d, e
- 2b. regions a, d
- 2c. regions a, b, c, d, f, g, h
- 3a. students who play and drive an SUV
- 3b. students who play bridge or those who do not live in dorms
- 3c. students who live in dorms and do not drive an SUV

4a. 230

4b. 160

4c. 225

5a.  $e=5$

5b.  $h=45$

5c.  $a+c+g=100$

6a. 1,307,674,368,000

6b. 12,441,600

7. 300,450,150

8. 420

9. 60

10a.  $2.458105888 \times 10^{20}$

10b.  $8.466337032 \times 10^{13}$

10c.  $1.628032027 \times 10^{20}$

11. True/False answers:

a. false

b. true

c. true

d. true

e. false

f.  $\{2,4,5\}$

g.  $\{1,2,3,4,5\}$

h.  $\{1,3\}$

i.

j.

k.

12.

a.  $\{\}, \{2\}, \{4\}, \{6\}, \{8\}, \{2,4\}, \{2,6\}, \{2,8\},$   
 $\{4,6\}, \{4,8\}, \{6,8\}, \{2,4,6\}, \{2,4,8\}, \{4,6,8\},$   
 $\{2,6,8\}, \{2,4,6,8\}$

b. 2

c. false, true

d. 2

13a. 11

13b.  $17+5+6=28$

13c.  $7+2+1+6=16$

13d. 6