Math 1313
Chapter 6 –Section 6.2
The Number of Elements in a Set

Let A be a set, then **n(A)** is the number of elements in A.

Example 1: Let A = {a, b, c} and B = {2, 6, 11, 13, 17}.

Find:

n(A)

n(B)

Given two sets A and B.

1. If A and B are disjoint then $n(A \cup B) = n(A) + n(B)$.

2. If A and B are not disjoint then $n(A \cup B) = n(A) + n(B) - n(A \cap B)$.

Example 2: Let A = {a, b, c, d, 1, 2, 3, 4, 5}, B = {a, d, e, 3, 5, 6} and C = {f, 7}.

Find:
a. n(A$\cup$B)

b. n(B$\cup$C)

Example 3: Let A and B be subsets of a universal set U. Given that $n(A\cap B)=3, n(A)=4$ and $n(A\cup B)=15$, find $n(B)$.

Example 4: Let A and B be subsets of a universal set U. Given that
$n(A\cup B^{c})=34, n(B^{c})=23$ and $n(A)=21$, find $n(A\cap B^{c})$.

Example 5: Let A and B be subsets of a universal set U. Given that $n(U) = 100$, $n(A^c) = 65$, $n(B) = 52$, and $n(A \cup B)^c = 33$, find $n(A^c \cap B)^c$.

Example 6: In a survey of 200 students at a fitness center of a certain university, it was found that 140 lift weights, 100 jog and 80 do both.

a. How many students lift weights or jog?

b. How many students jog only?

c. How many students do not jog or lift weights?

d. How many students jog or lift weights but do not do both?

e. How many students do at least one of these activities?

Example 7: In a recent survey of 300 people regarding the kind of pet they have, the following information was gathered: 160 own a dog, 150 own a cat, and 150 own a bird. Ninety own a dog and a cat, 70 own a cat and a bird, 100 own a dog and a bird, and 40 own all three.

a. How many people own a bird only?

b. How many people own a dog or a cat, but not a bird?

c. How many people own a dog and a cat?

d. How many people own a dog or a bird?

e. How many people own exactly two of the three pets mentioned?

f. How many people own at most one of the three pets mentioned?

Example 8: In a gardener's club of 245 people, 89 indicated that they use only Plant Life fertilizer in their garden, 91 indicated that they do not use Green's fertilizer in their garden and 230 indicated that they use exactly one of these two types of fertilizer in their garden. How many people in the gardener's club use at most one of these types of fertilizer in their garden?

Example 9: A survey was taken at a local community college. The survey indicated that

65 students study at school or at home but not at the coffee shop,

189 students study at the coffee shop and at home,

41 students study only at school and at the coffee shop,

66 students do not study at the coffee shop,

248 students study at home,

159 students study at all three places,

126 students study at exactly two of the three places, and

2 students study only at the coffee shop.

How many students surveyed study at at least two of the three places mentioned?