

MATH 210

FINITE MATHEMATICS

BRIAN VEITCH • FALL 2016 • NORTHERN ILLINOIS UNIVERSITY

6.2 Number of Elements

- Determined by counting the all the elements in the set
- Denoted by $n(A)$

Example 1

Let $A = \{0, -1, 5, 7\}$, $B = \{0, 1, 2, 3, \dots, 15\}$, $C = \emptyset$,
and $D = \{x \mid x \text{ is a letter of the alphabet}\}$. Find

1. $n(A)$
2. $n(B)$
3. $n(C)$
4. $n(D)$
5. $n(B \cup D)$
6. $n(A \cap B)$
7. $n(A \cup B)$

Formula 1

For any two sets A and B

Example 2

In a survey of 100 coffee drinkers, it was found that 70 take sugar, 60 take cream, and 50 take both.

1. How many coffee drinkers take sugar or cream?

2. How many take neither sugar nor cream?

Example 3

In a recent survey of 200 people, 100 of them indicated they subscribe to Hulu, 60 indicated they subscribe to Netflix, and 40 indicated they subscribe to both.

1. How many people subscribe to at least one service?
2. How many subscribe to ONLY Hulu?
3. How many subscribe to exactly one of the services?
4. How many subscribe to neither service?

Formula 2

For any three sets A , B , and C

.

Example 4

If $n(A) = 12$, $n(B) = 12$, $n(A \cap B) = 5$, $n(B \cap C) = 4$, $n(A \cap C) = 5$, $n(A \cap B \cap C) = 2$, and $n(A \cup B \cup C) = 25$. Find $n(C)$

Example 5

Let A and B be subsets of U and suppose $n(U) = 200$, $n(A) = 100$, $n(B) = 80$, and $n(A \cap B) = 40$. Compute

1. $n(A^c)$

2. $n(a \cap B^c)$

Example 6

A survey of 50 students was conducted and the following results were obtained:

20 like math

35 like science

16 like English

13 like math and science

5 like math and English

7 like science and English

3 like all three

1. How many students like at least one of the subjects?
2. How many students liked non of the subjects?
3. How many liked math and science but not English?
4. How many liked math or English?