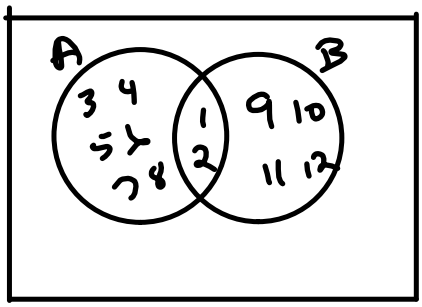
A = {~~1~~, ~~2~~, 3, 4, 5, 6, 7, 8} 8

B= { 9, 10, 11, 12, ~~1~~, ~~2~~} + 6 = 14

Find n(A U B) = 12

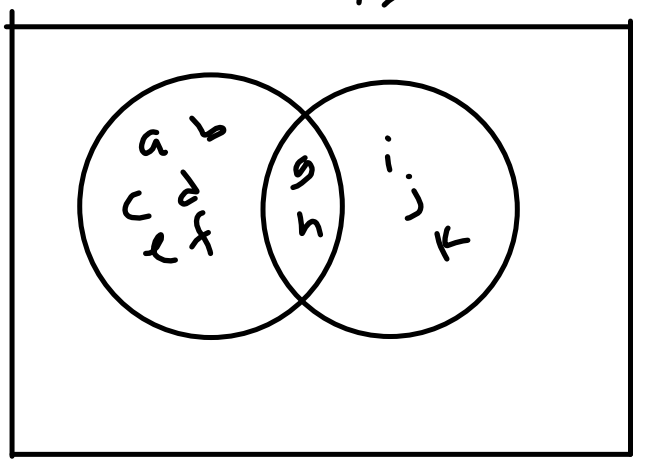


Find n(A U B) = 11

A={a, b, c, d, e,f, g, h} 8

B={g, h, i, j, k} + 5

13 - 2 = 11



Rule:

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

Example

Set A contains 15 elements
Set B contains 7 elements
Both sets have 4 elements in common

Find the number of elements in the union of set A and B.

$15 + 7 - 4 = 18$

page 65 Example 7

The results of a survey of visitors at the Grand Canyon showed that 25 speak Spanish, 14 speak French, and 4 speak both Spanish and French. How many speak Spanish **or** French?

$$n(S \cup F) = n(S) + n(F) - n(S \cap F)$$
$$= 25 + 14 - 4$$
$$= 35$$

Pg 65 Example 8

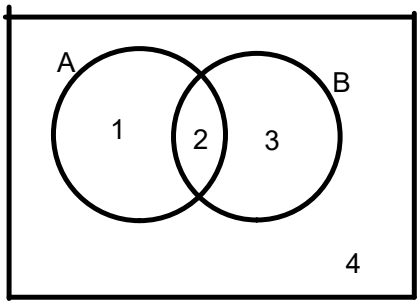
Of the homes listed for sale with REMAX, 39 have either a three-car garage or fireplace, 31 have a fireplace, and 18 have both a three-car garage and a fireplace.
How many of these homes have a three-car garage?

$$n(F \cup G) = n(F) + n(G) - n(F \cap G)$$
$$39 = 31 + x - 18$$
$$39 = 13 + x$$
$$-13 \quad -13$$
$$26 = x$$

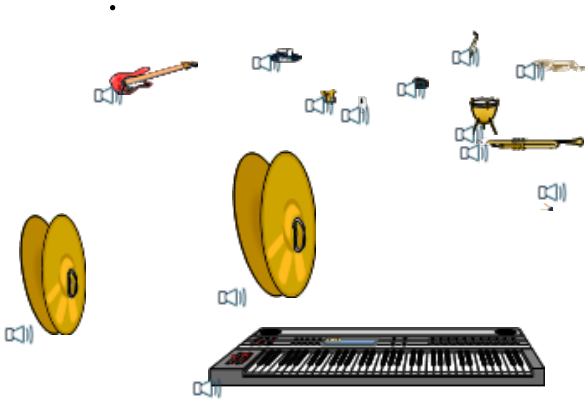
At Trumbull High School 140 students took Statistics or Applied Topics in Math in 2010. Fifty five took Statistics and 12 took both Statistics and Topics. How many students took Applied Topics?

$$n(T \cup S) = n(T) + n(S) - n(T \cap S)$$
$$140 = x + 55 - 12$$
$$140 = x + 43$$
$$-43 \qquad -43$$
$$x = 97$$

The difference of two sets A and B, A - B is the set of elements that belong to set A but not to set B.



A - B = region 1 only

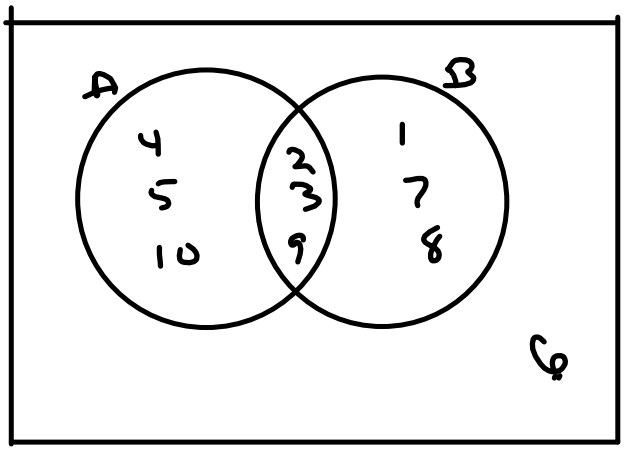


Example

U = {1, 2, ...,10}

A = {2,3,4,5,9,10}

B = { 1,2,3,7,8,9}



Find:

A - B = {4,5,10}

B - A {1,7,8}

A - B'

A = {2 3 4 5 9 10}

B' = {4, 8, 10, 6}

2 3 4 9 10

A - B' = {2, 3, 9}