

## 8.3 Applications



## Solve the Mystery

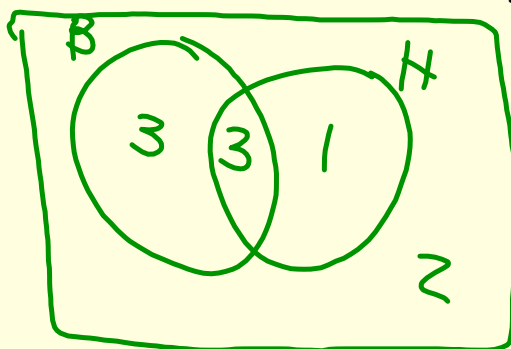
In a class of 9 students:

6 students take IB Biology

4 students take IB History

→ 3 students take both IB Biology and IB History

How many students take ~~neither~~ IB Biology nor IB History?



2 students

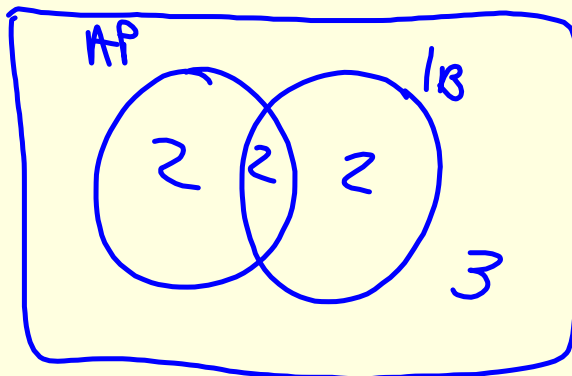
## Solve the Mystery

In a class of 9 students:

- 8 4 students take AP Microeconomics
- 4 students take IB French
- 3 students take neither AP Micro nor IB French

How many students take both AP Micro and IB French?

6  $\rightarrow$  AP  $\cup$  IB



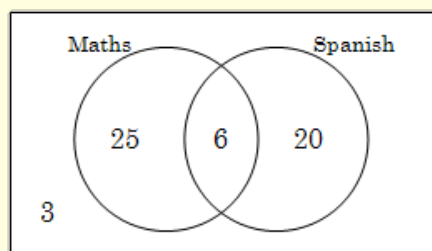
2 students.

## Applications of Venn Diagrams

Venn diagrams can be really helpful in sorting information and solving problems.

One key skill is to remember that the overlap/intersection part is included in the count of each of the sets, but only once in the union of the sets.

Another key skill is to recognize the language of the question and notice when the words "only", "both", "or", and "neither" are used.



How many students are in 11<sup>th</sup> grade?

54

How many students study Maths?

31

How many students study Spanish?

26

How many students study ~~only~~ Maths?

25

How many students study only Spanish?

20

How many students study Maths or Spanish?

51

How many students study Maths and Spanish?

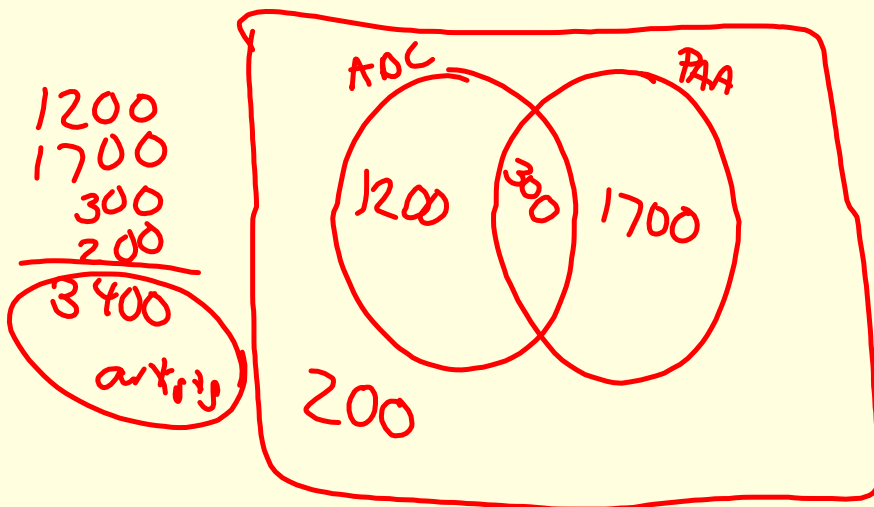
6

How many students study Maths or Spanish, but not both?

45

When you are given information to create a Venn diagram, it is usually best to start with the overlap of the sets and work your way out.

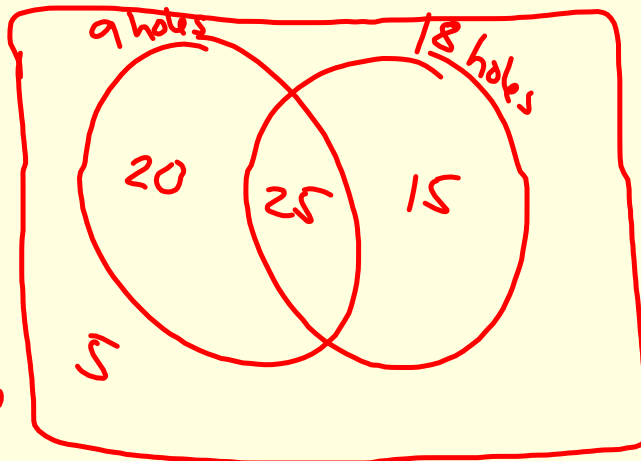
Example 1: There are two artist guilds in a city: the ABC and the PAA. 300 artists in the city are members of both guilds and 200 are members of neither. There are 1500 total members of the ABC guild and 2000 total members of the PAA. How many artists are in the city?



Example 2: There are 65 golf players at a charity tournament. 45 of these players will play 9 holes of golf and 40 will play 18 holes. There are 5 people at the tournament who have decided not to play at all. How many people will play both 9 holes and 18 holes of golf? **25 play both.**

60 total play

$$\begin{array}{r} 45 \\ + 40 \\ \hline 85 \\ - 60 \\ \hline 25 \text{ overlap} \end{array}$$





When there are three sets, the strategy is the same: Start in the middle and work your way out.

In a survey of children who saw three different shows at Walt Disney World, the following information was gathered:

39 children liked The Little Mermaid

43 children liked 101 Dalmatians

56 children liked Mickey Mouse

7 children liked The Little Mermaid and 101 Dalmatians

10 children liked The Little Mermaid and Mickey Mouse

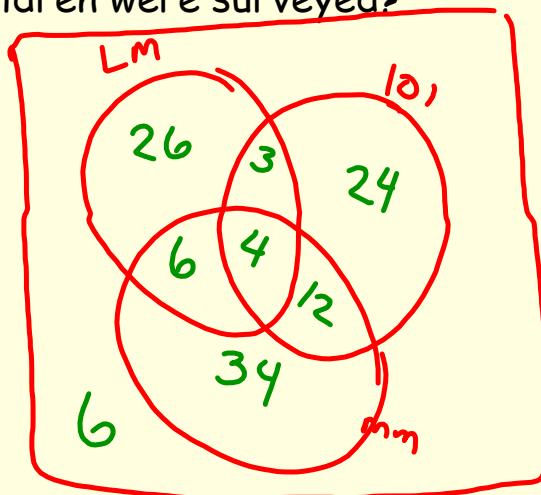
16 children liked 101 Dalmatians and Mickey Mouse

4 children liked The Little Mermaid, 101 Dalmatians, and Mickey Mouse

6 children did not like any of the shows

How many children were surveyed?

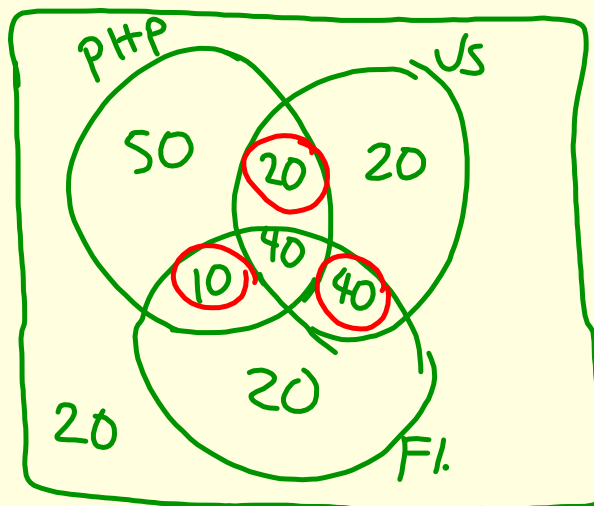
115 kids.



A web software company decides to do a survey of its 220 employees to find out which web programming languages they know. They discover:

- 20 of their employees know no programming languages
- 40 know PHP, JavaScript and Flash
- 60 know PHP and JavaScript
- 50 know PHP and Flash
- 80 know JavaScript and Flash
- 120 know PHP
- 120 know JavaScript
- 110 know Flash

How many of their employees know exactly two languages?



70 employees

Homework: pages 347-348:1-5 all, pages 350-351: 2-5 all