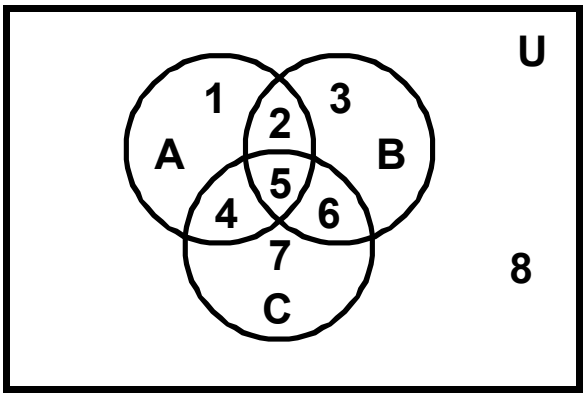
Venn Diagrams

Need to know

The language of sets, everything else is arithmetic.

Let's look at a Venn Diagram made up of three sets in which the regions are labeled. Now, we'll describe each region.



Region 5 is in all three circles. So any elements in region 5 would belong to all three sets. In other words; $A \cap B \cap C$.

What about Region 2? Those are the elements in A and B, but not C. How might you describe Region 6? Those are elements in B and C, but not in A. Try Region 4. The elements in A and C, but not B.

This is fun; let's look at some more regions. Region 1 describes the elements in A only. What about region 3? Those elements are only in B. Region 7 then would be the elements in C only. Region 8 would describe elements that are not members of any of the sets, but belong to the universal set.

1. A survey of 70 high school students revealed that 35 like folk music, 15 like classical music, and 5 like both. How many of the students surveyed do not like either folk or classical music?

2. Out of 35 students in a finite math class, 22 are male, 19 are business majors, 27 are freshmen, 14 are male business students, 17 are male freshmen, 15 are freshmen business majors, and 11 are male freshmen business majors. How many upper-class women non-business majors are in the class? How many women business majors are in the class?

3. A survey of 100 college faculty who exercise regularly found that 45 jog, 30 swim, 20 cycle, 6 jog and swim. 1 jogs and cycles, 5 swim and cycle, and 1 does all three. How many of the faculty members do not do any of these three activities? How many just jog?

4. After a genetics experiment, the number of pea plants having certain characteristics were tallied, with the results as follows.

22	were tall
25	produce green peas
39	produce smooth peas
9	are tall and produce green peas
17	are tall and produce smooth peas.
20	produce green peas and smooth peas
6	have all three characteristics
4	have none of the characteristics.

(a) Find the total number of plants counted.
(b) How many plants are tall, but produce peas which are neither smooth nor green?
(c) How many plants are not tall, but produce peas which are smooth and green?

5. A survey was taken of 650 university students. It was reported that 240 were taking math, 290 were taking biology, and 270 were enrolled in chemistry. Of those students, 80 were taking biology and math, 70 were taking math and chemistry, 60 were taking biology and chemistry, and 50 were taking all three classes. How many students took math only?