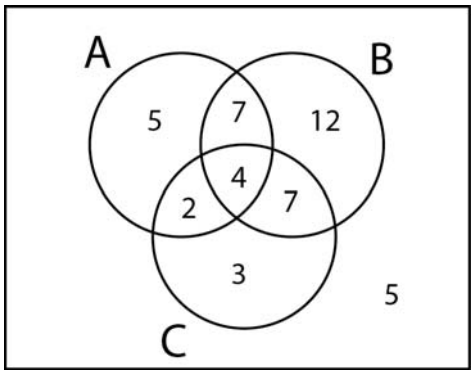
We survey 100 people and split them up as being or *not* being in sets A, B, and C. What more can we learn?

General Education Mathematics
Class Notes
Survey Problems (Section 2.4)

We have talked before of how we can think of the regions in a Venn diagram as distinct areas, labeling each region with the number of elements in that region.

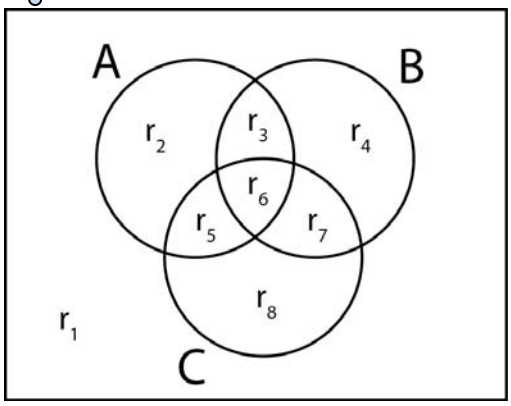
For instance, we have seen this Venn before. Let's put some meaning to it. Let's say that we asked 45 people questions about the music they like.
Let A be the set of people who like country music.
Let B be the set of people who like rock music.
Let C be the set of people who like classical music.



The numbers in each region are the numbers of people in that region. For instance, there are 5 people who like country but neither rock nor classical. Can you mark this region?

Generic Venn diagrams will have regions labeled as r_1, r_2, r_3, etc.

expl 1: For this generic Venn diagram, use set notation to name the regions indicated. There may be more than one answer.



a.) r_6

b.) r_6 and r_5 together

c.) r_8

expl 2: For the Venn in the previous example, which regions comprise the set C – B?

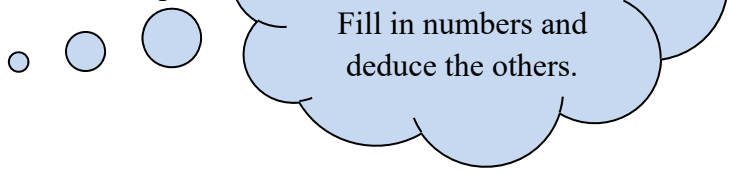
Survey Problems:

These problems arise from survey data. Perhaps we asked lots of people questions or delved into existing records. What more can we glean from the information we gather? Here is an example that splits our survey data into two sets.

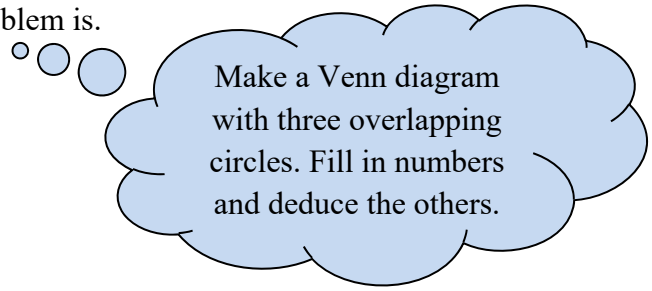
expl 3: An investigation of auto accidents revealed the following information.

18 accidents involved alcohol and excessive speed
26 accidents involved alcohol
12 accidents involved excessive speed but *not* alcohol
21 accidents involved *neither* alcohol *nor* excessive speed

How many accidents were investigated?



expl 4: From the information below, find the number of elements in the sets A, B, and C. If the data is inconsistent, say so and state where the problem is.



$A \cap B = \varnothing$, $n(A \cap C) = 5$, $n(B \cap C) = 3$,

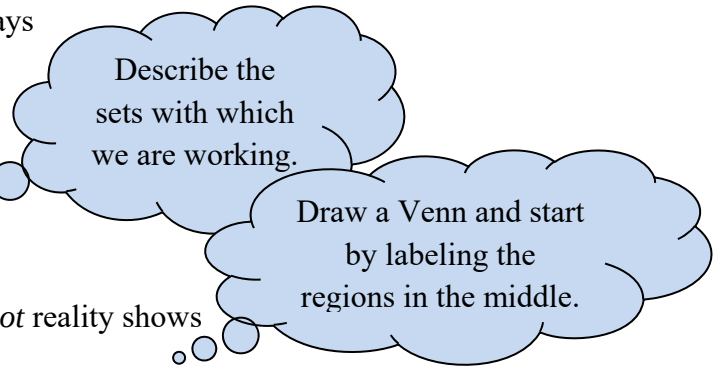
$n(C - A) = 7$, $n(A - C) = 2$, $n(U) = 14$

The **cardinal numbers** of these sets are $n(A) =$ _____, $n(B) =$ _____, and $n(C) =$ _____.

Worksheet: Exploring Venn Diagrams:
This worksheet will practice the next type of problem. We are given the number of elements in several regions of a Venn and asked to determine the rest.

expl 5: A television network conducted a market survey to determine the evening viewing preferences of people in the 18–25 age bracket. The following information was obtained.

3 prefer a reality show early on weekdays
14 want to watch TV early on weekdays
21 want to see reality shows early
8 want reality shows on weekdays
31 want to watch TV on weekdays
36 want to watch TV early
40 want to see reality shows
13 prefer late, weekend shows that are *not* reality shows



From this information, determine how many people surveyed do *not* want to see reality shows and how many people surveyed prefer to watch TV on the weekend.

So, how many people surveyed do *not* want to see reality shows?

And, how many people surveyed prefer to watch TV on the weekend?