

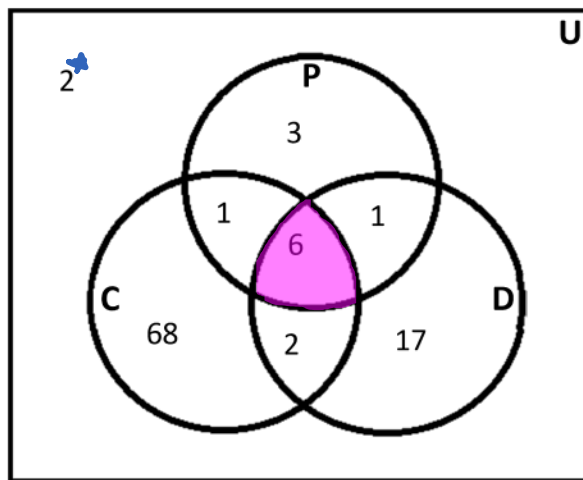
# 1.4 - Venn Diagrams Pt. II

October 18, 2019 9:35 AM

This section will explore Venn diagrams with more than two sets.

### Example

The following Venn diagram represents the movies 100 students watched over the last month.  $P$  represents the number of students who watched “Promises,”  $D$  represents “Driver,” and  $C$  represents “The Cartographer”:



How many students watched only “Promises”?

3

How many students watch “Promises”?

$$3 + 1 + 1 + 6 = 11$$

How many students watched “The Cartographer” and “Driver”?

$$6 + 2 = 8$$

How many students watched “The Cartographer” or “Driver”?

$$68 + 1 + 6 + 2 + 1 + 17 = 95$$

How many students watched all 3 movies?

6

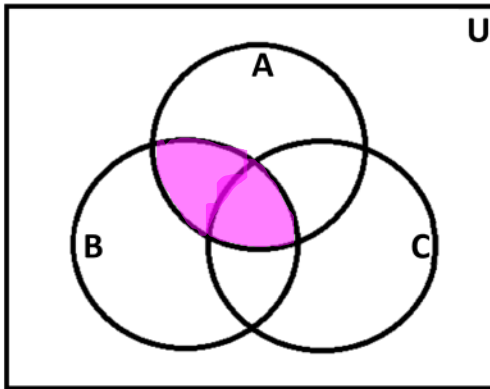
What does the number 2 represent?

The number of kids who didn't watch any movies.

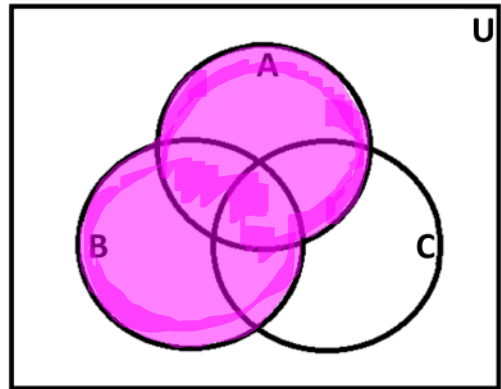
**Example**

Shade the indicated regions in the following diagrams:

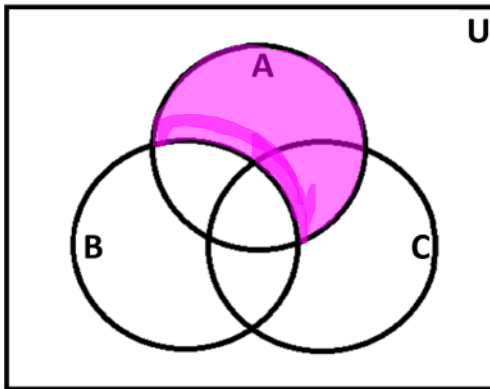
A and B =  $A \cap B$



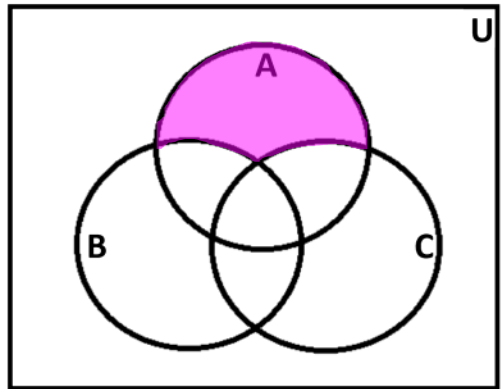
A or B =  $A \cup B$



A and not B =  $A \cap B'$



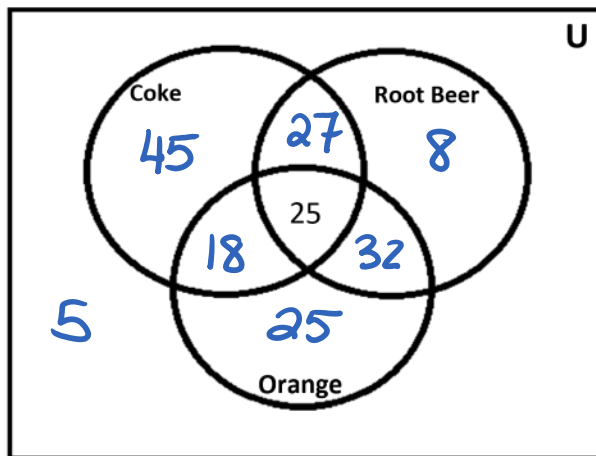
A and not B and not C =  $A \cap B' \cap C'$



**Example**

185 students at GSS were surveyed about their preferences for the drinks they prefer to order. The results are tabulated below:

- 100 drank orange
- 115 drank coke
- 92 drank root beer
- 57 drank root beer and orange
- 43 drank coke and orange
- • 52 drank root beer and coke
- • 25 drank all three



If I begin filling in the above Venn diagram from the center, why would I place the number 27 above the center?

$$52 - 25 = 27$$

R+C    R+C+O

Using the same reasoning, what numbers would be placed in the regions to the left and right of the center?

Orange + Coke only

$$43 - 25 = 18$$

Root Beer + Orange only

$$57 - 25 = 32$$

Continue to place the remaining numbers.

coke only:  $115 - (27 + 25 + 18) = 45$

r.b. only:  $92 - (27 + 32 + 25) = 8$

orange only:  $100 - (32 + 25 + 18) = 25$

How many elements are only in the universal set?

sum of all elements = 180

185 were surveyed,

$$\therefore n(U) = 185 - 180$$

$$n(U) = 5$$