

# Sets: Venn Diagrams

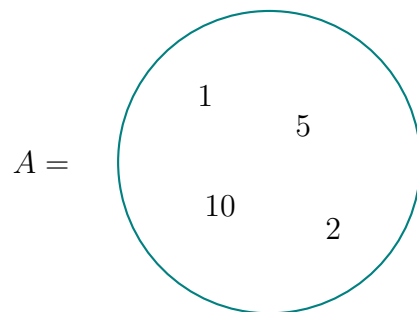
Video companion

## 1 Visualizing sets

- Venn diagrams
- Inclusion-exclusion formula
- Medical testing example, re-visited

## 2 Single set

$$A = \{1, 5, 10, 2\} \quad |A| = 4$$

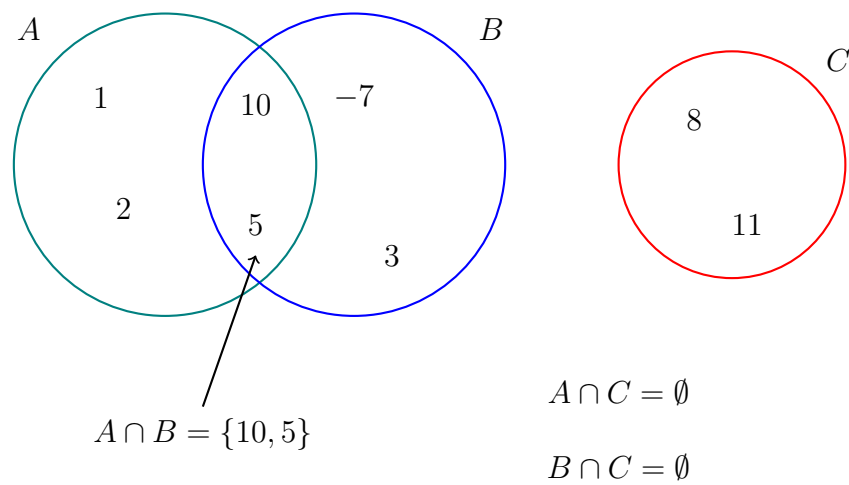


### 3 Multiple sets

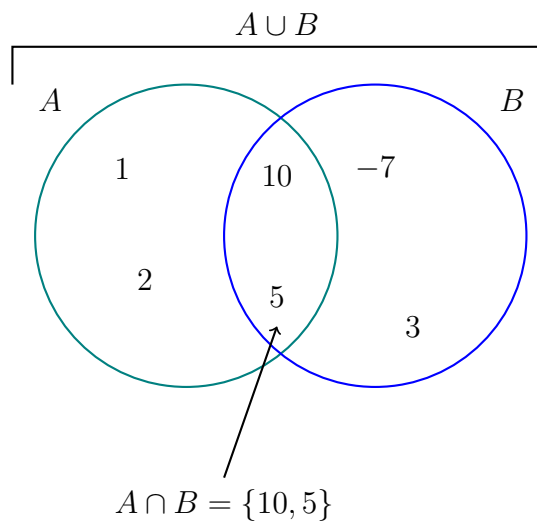
$$A = \{1, 5, 10, 2\}$$

$$B = \{5, -7, 10, 3\}$$

$$C = \{8, 11\}$$



## 4 Inclusion-exclusion formula



**Inclusion-exclusion formula:**

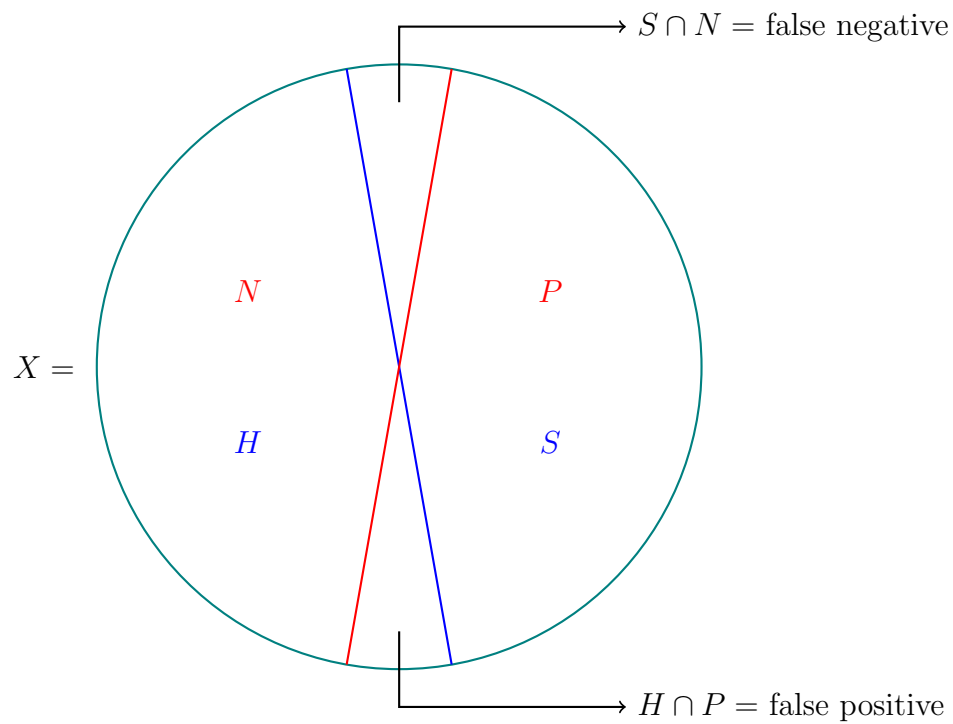
$$|A \cup B| = |A| + |B| - |A \cap B|$$

Check with this example:

$$6 \stackrel{?}{=} 4 + 4 - 2$$

$$6 = 6 \quad \checkmark$$

## 5 Medical testing example



$$\begin{aligned} X &= H \cup S & H \cap S &= \emptyset \\ S &= N \cup P & N \cap P &= \emptyset \end{aligned}$$