Definitions

- A **set** is a collection of objects.

- The **members** of a set are the individual objects within it.

- Write sets by listing their members within a pair of braces, { }.

- Use three dots, …, to indicate a continuing pattern if there are too many members to list.

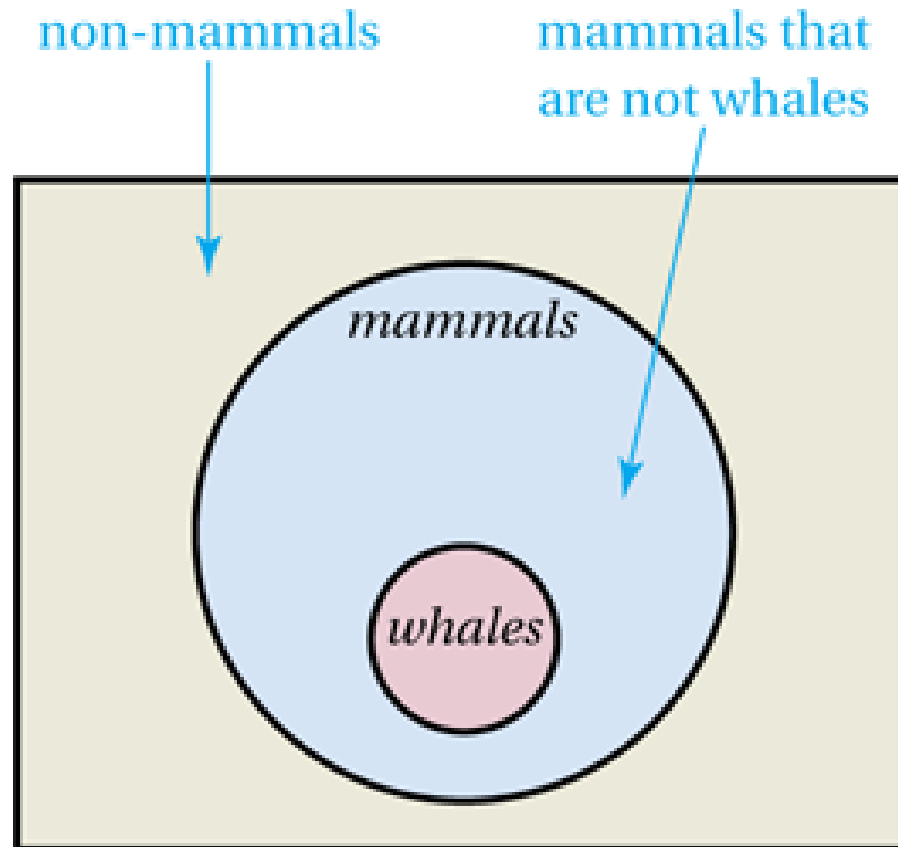- A **Venn diagram** is a diagram that uses circles to represent sets.

Example

- Use set notation to write the members of the following set.

  - Days of the week that start with the letter "S"
    $$\{Saturday, Sunday\}$$

  - The whole numbers from 20 to 1000
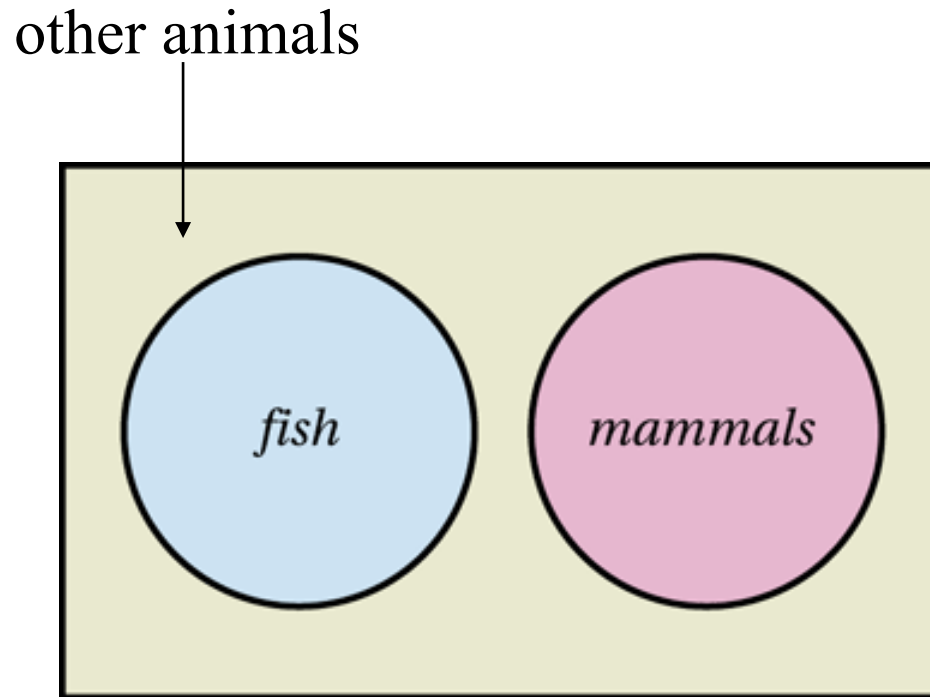 $$\{20, 21, 22, \ldots, 999, 1000\}$$

Set Relationships

- A is a **subset** of B if all members of A are also members of B.

- A is **disjoint** from B if they have no members in common.

- A and B are **overlapping** sets if the they share some of the same members.

Venn Diagram for Categorical Propositions

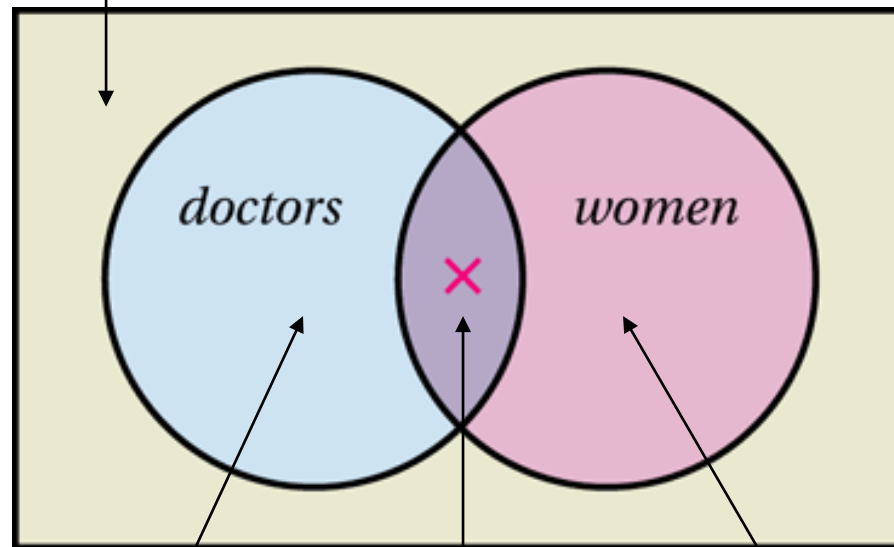The set whales is a subset of the set mammals.

Venn Diagram for Categorical Propositions

other animals

The set of fish is disjoint from the set mammals.

Venn Diagram for Categorical Propositions

men who are
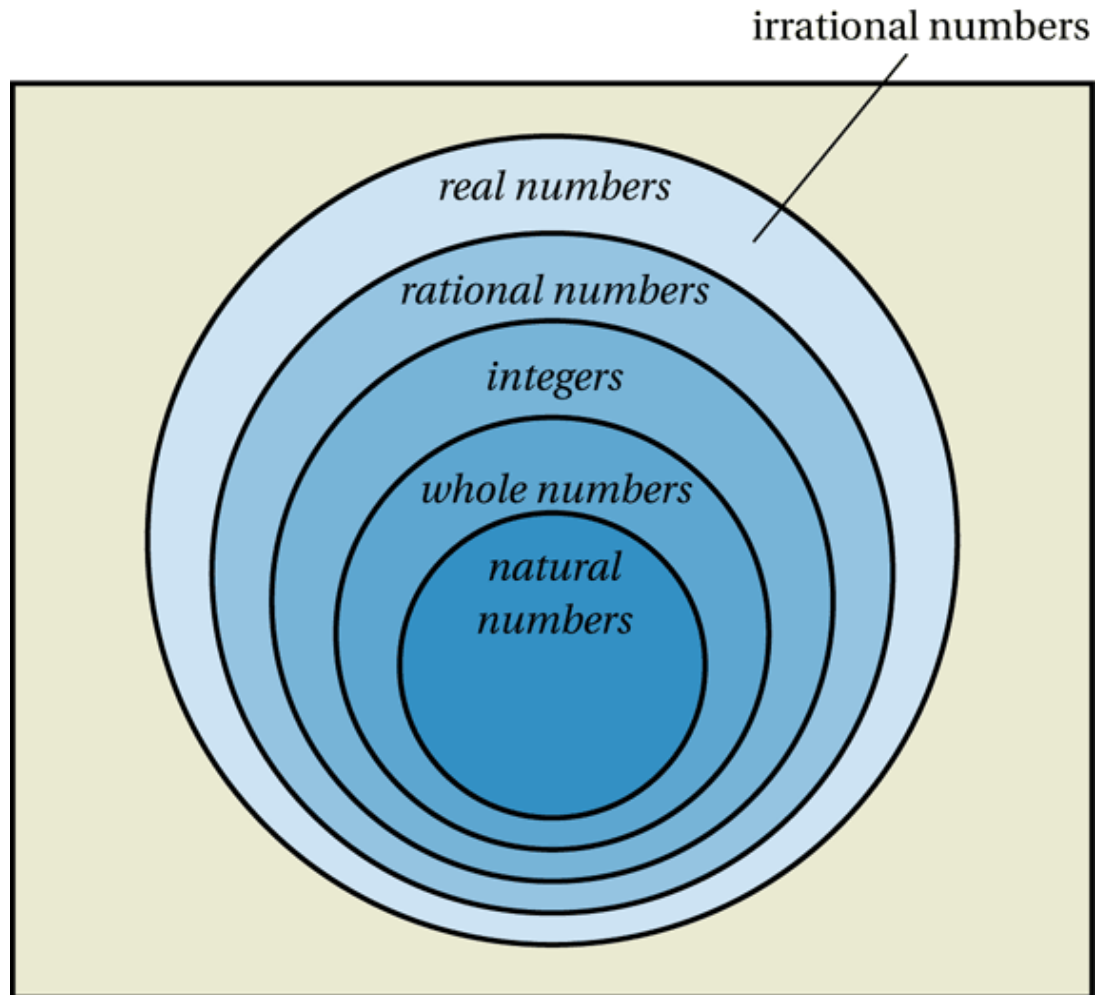not doctors

doctors   women

×

male
doctors

female
doctors

women who are
not doctors

The sets of doctors and women are overlapping.

Real Number Venn Diagram

Example

- Draw a Venn diagram with two circles showing the given relationship between two sets: *Students at BYU-Hawaii* and *Women*

Categorical Propositions

- Propositions involving sets are called **categorical propositions**.

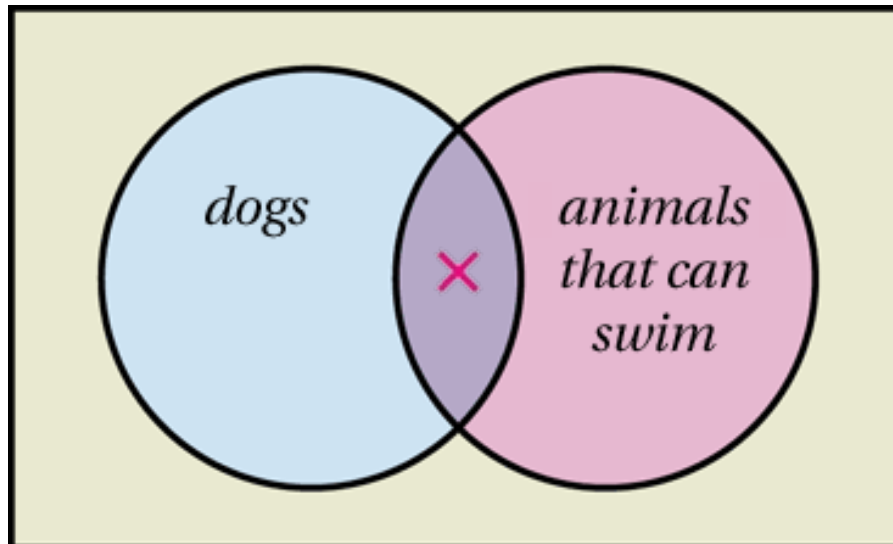|	
All X are Y.	All soccer players are athletes.
No X are Y.	No cats are dogs.
Some X are Y.	Some singers are actors.
Some X are not Y.	Some doctors are not men.

Constructing a Venn Diagram

Statement: "Some dogs can swim."

Rephrase to: "Some dogs are animals that can swim."

Construct the Venn diagram:

Example

- In the following categorical propositions, identify the subject and predicate sets and draw a Venn diagram for the proposition.

  - No worms are birds.

  - Winners smile.

Example

	Biology	**Business**
Women	31	105
Men	18	79