Section 1C

Sets and Venn Diagrams

A **set** is any collection of objects, living or nonliving.

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

Example: Set: states in the U.S. that begin with "T"

Members: Tennessee, Texas

Sets are usually states by listing members within a pair of braces, { }.

Example: States beginning with "T" –

{Tennessee, Texas}

Some sets have too many members to list them all – instead we use ellipsis (three dots) to indicate that the list continues in the same manner

Example: Whole numbers between 1 and 100

{1, 2, 3, …, 100}

If the ellipsis is at the end of the listing, it indicates that the list continues in the same manner indefinitely.

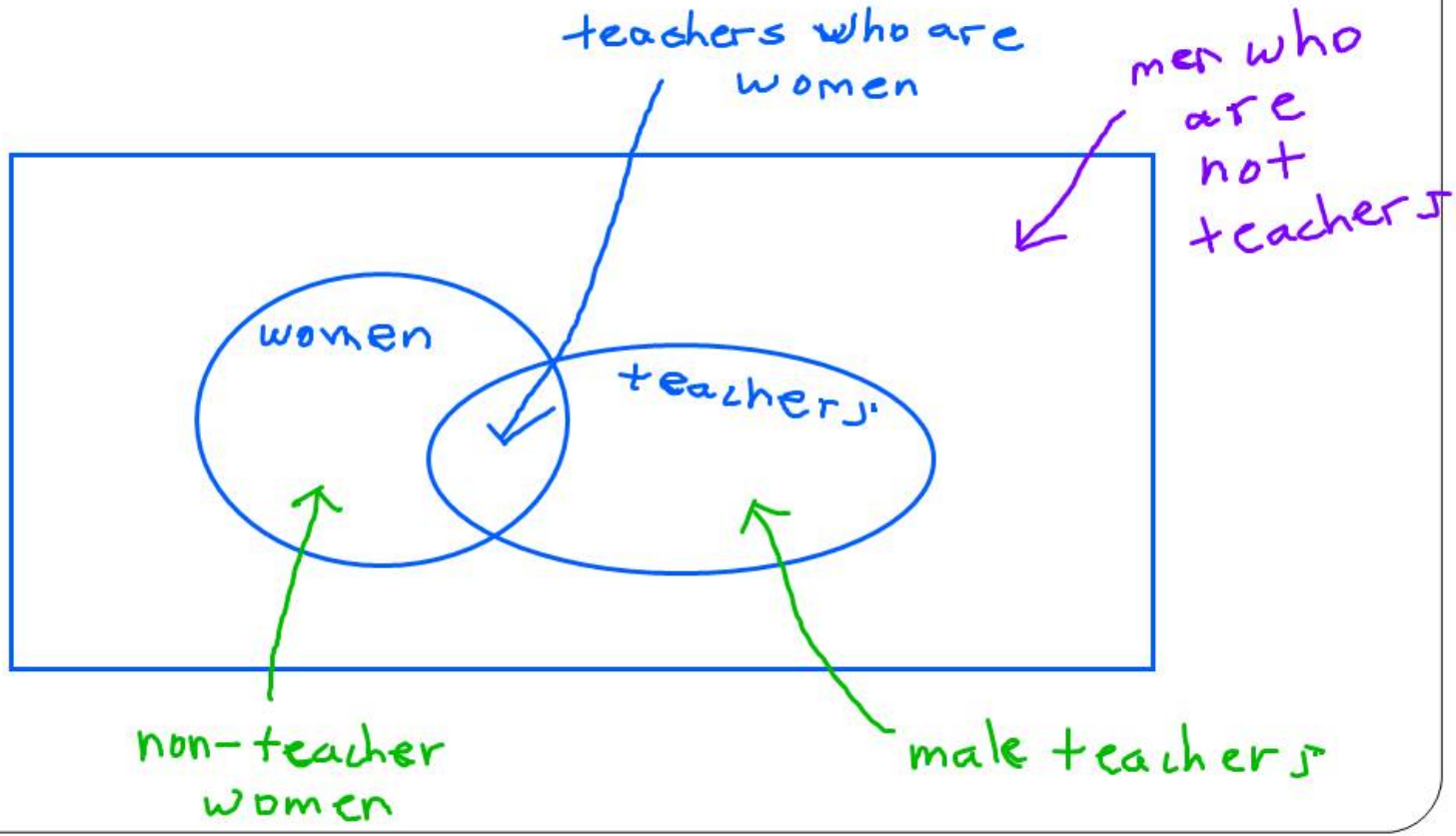
Example: Even natural numbers – {2, 4, 6, … }

Venn diagrams use circles to represent sets and shows how different sets are related to one another.

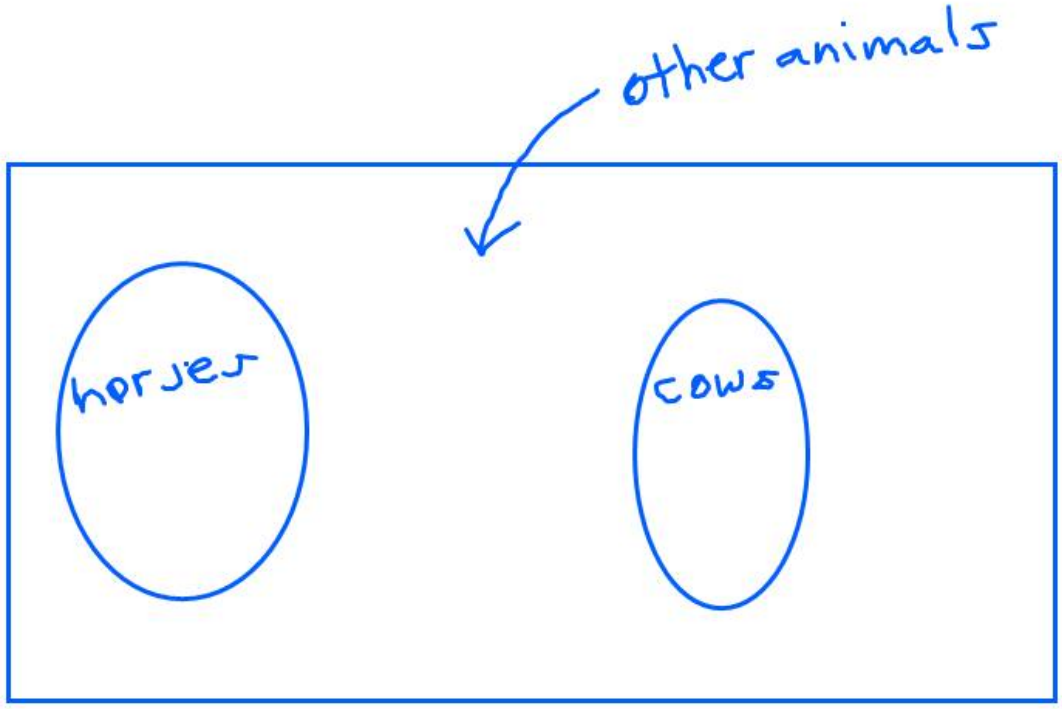
The circles are used to show the sets that are being considered.

The circles are enclosed by a rectangle that shows the “universal set” which includes all items that could be considered.

Example: Draw a Venn diagram to show the relationship between the sets “teachers” and “women”



Draw a Venn diagram to show the relationship between the sets “horses” and “cows”



Consider sets A and B.

- A is a **subset** of B, if all members of A are also members of B. The circle for A would be inside the circle for B in the Venn diagram.

- A is **disjoint** from B if the two sets have no members in common. The circles would not touch in the Venn diagram.

- A and B are **overlapping** if they have some members in common. The circles would overlap.

Sets of Numbers

Natural numbers – also known as counting numbers {1, 2, 3, … }

Whole numbers – natural numbers with zero included {0, 1, 2, 3, … }

Integers – whole numbers and their negatives

{…, -3, -2, -1, 0, 1, 2, 3, … }

Rational numbers – integers and all numbers that can be written as fractions

Irrational numbers – all numbers that cannot be written as fractions

Real numbers – consists of both rational and irrational numbers

Venn diagrams can be used to represent more than two sets also.