Set difference and Euler Diagrams

Thursday, October 25, 2018  1:24 PM

\[ A - B = \{ \text{elements in A but not in B} \} \]

\[ B - A = \{ \text{elements in B but not in A} \} \]

\[ A \Delta B = (A - B) \cup (B - A) \]

\[ A = \{1, 2, 3, 4, 5\} \]

\[ B = \{3, 4, 5\} \]

\[ A - B = \{1, 2\} \]

\[ B - A = \{3, 4, 5\} \]

get rid of the elements in \( A \)

Notice, we normally draw the Venn Diagram like this
However, what if I had 2 sets which are disjoint?

Then I can draw them so they don't overlap.

What if I knew that \( B \subseteq A \)?

I can draw it like this.

**Euler Diagrams**

64. All animals have 4 legs. Cats are animals. \( \therefore \) Cats have 4 legs.

\( \Rightarrow \) \( A \subseteq L \)

\( \therefore c \in A \)

\( \Rightarrow \) \( c \in L \)? Is this true based on the Euler diagram?

\( \therefore L \in A \) So cats have 4 legs.

The argument is **valid**.
70. Some nurses wear blue uniforms. Jennifer is a nurse.

\[ N \cap B \]

\[ \bar{N} \cap \bar{B} \]

Therefore, Jennifer wears a blue uniform.

I don't know where to draw Jennifer!

Is it possible for her to not wear a blue uniform? Yes!

So the argument is **NOT Valid**.

60. No birds are mammals.
The cardinal is a bird.

Therefore, the cardinal is not a mammal.

The cardinal is definitely not in M, so the argument is **Valid**.