Objective:

Use the law of detachment and the law of syllogism.
Write a conditional to describe the above Venn diagram.

If she is a witch, then she weighs as much as a duck!
If I give you this conditional

If she is a witch, then she weighs as much as a duck!

AND tell you that someone is a witch, what is the only conclusion you can make?

They weigh as much as a duck!

This is called the Law of Detachment

If a conditional is true and its hypothesis is true, then the conclusion is true.

Symbolic Form: If $p \rightarrow q$ is a true statement and $p$ is true, then $q$ is true.
For the given true statements, what can you conclude?

1. If it is made of wood, then it floats on water.
   My boat is made of wood.

   Conclusion:

   Using the Law of Detachment, your only conclusion is that my boat floats on water.

2. If M is the midpoint of a segment, then it divides the segment into two congruent segments.
   M is the midpoint of AB.

   Conclusion:

   Using the Law of Detachment, your only conclusion is that AM = MB.

   M divides the segment into two congruent segments.
Here are two conditionals that we will assume true:

If she is a witch, then she weighs as much as a duck.
If she weighs as much as a duck, then she floats on water.

What conclusion can you make from the above statements?

If she is a witch, then she floats on water!

This is called the **LAW OF SYLLOGISM**

If \( p \rightarrow q \) and \( q \rightarrow r \) are true statements, then \( p \rightarrow r \) is a true statement.
For the given statements, what can you conclude?

1. If a number is prime, then it does not have repeated factors.
   If a number does not have repeated factors, then it is not a perfect square.

   Conclusion:

   If a number is prime, then it is not a perfect square.

2. If a number is divisible by 10, then it is divisible by 5.
   If a number ends in 0, then it is divisible by 10.

   Conclusion:

   If a number ends is 0, then it is divisible by 5.
HOMEWORK

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