Module 1: Logic and Reasoning
Topic 3 Content: Law of Syllogism Transcript

Hi, guys. Welcome to Geometry. This topic is going to focus on the law of syllogism. You're going to use your logic and your reasoning skills in order to draw valid conclusions. You ready to get started? Let's go.

Before we dive into the law of syllogism, I want to talk a little bit about inductive reasoning. Inductive reasoning is the use of patterns in order to draw a valid conclusion. For example, we're going to use inductive reasoning to determine the next two terms in this sequence.

We see we have two, four, six. It appears that we're counting by twos here, right? So, two, four, six... If we complete this pattern, the next two terms should be eight and ten if the sequence continues in the way that we seem to be observing by the pattern here, right? Here we used inductive reasoning to draw a valid conclusion.

Now, deductive reasoning is the use of laws and definitions and facts in order to draw a valid conclusion. You don't necessarily observe a pattern or make observations in the way that you do with inductive reasoning. You just determine if whatever set of arguments you're given follow a law or rule of some sort.

The law of syllogism, symbolically, is like this: If p then q. If q then r. Therefore, if p, then r.

If p then q is true, if q then r is true, you can conclude therefore that if p then r is true.

You can think of the law of syllogism as the chain rule. If p then q, if q then r, if p then r. In a way, it's like you're cutting out that middle man. It's like q is the middle man linking that whole chain together. Again, the law of syllogism, if p then q, if q then r, therefore if p then r.

Let's look at a couple of examples and see this in action.

> If Taylor goes to the pizzeria, then she will order a cheese pizza.

I've tried to color code it for you here.

> "Taylor goes to the pizzeria. . ." That's p.
> ". . .she will order a cheese pizza." That's q.
> "If she orders a cheese pizza, then she will need garlic powder." Again, "she orders a cheese pizza. . ." That's q.

Notice that second sentence picks up right where that first one left off.

> ". . .she will need garlic powder." That's r.

If Taylor goes to the pizzeria, then she will order a cheese pizza. If she orders a cheese pizza, then she will need garlic powder. You can conclude from the law of syllogism:

> Therefore, if Taylor goes to the pizzeria, then she will need garlic powder.

Notice how you can really tell from the color coding: The first sentence is blue then green, green then purple, therefore blue then purple. We cut out q. We cut out that chain in the middle that was linking those two phrases together. Our conclusion just joins p with r.

Let's look at another example of the law of syllogism in action.

> If you live in Virginia Beach, then you live in Virginia.
> If you live in Virginia, then you live in the United States.

Our conclusion—remember, the law of syllogism, it's like the chain rule: "If p, then q. If q, then r. Therefore. . ."—let's see this conclusion here: "If p, then r." Therefore, if you live in Virginia Beach, then you live in the United States.

Notice again, you can really tell from the color coding that you're cutting out that middle part. You're cutting out that part that's repeated.

Let's take a look at this, which I do believe is an example for you. I'm going to give you a few arguments here, two sentences, and I want you to use the law of syllogism to draw a valid conclusion. I'm going to move on to the next slide. Be sure to press pause and take your time writing out that valid conclusion.

Let's see how you did here.

"If it is Friday, then Abby will play basketball after school."

> "It is Friday." There's our p.
> "Abby will play basketball after school." There's our q.

"If Abby plays basketball after school, then she will need to wear sneakers."

> "If Abby plays basketball after school. . ." There's q again.
> ". . .then she will need to wear sneakers." There's r.

Based on the law of syllogism, a valid conclusion will be:

> "Therefore, if it is Friday. . ." (there's our p) ". . .then, Abby will need to wear sneakers" (there's our r).

You see, again, how it follows a chain rule? It's that middle part that you're just chopping out when you write your conclusion.

Okay, guys. I hope you saw how to use your logic and reasoning skills to use the law of syllogism to draw valid conclusions. Bye.