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11-16 ✓  
17↑-

## 2.3 Deductive Reasoning

· process of using logic to draw conclusions from given facts, definitions, & properties.

## Law of Detachment

If  $P \Rightarrow Q$  is true and  $P$  is true, then  $Q$  must be true.

Ex: Given: In the world series if a team wins four games, then they win the world series. The Red Sox won 4 games in the 2004 world series.

Conjecture: The Red Sox won the 2004 world series.

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True by the Law of Detachment

## Law of Syllogism

If  $P \rightarrow Q$  is true and if  $Q \rightarrow R$  is true, then  $P \rightarrow R$  must be true.

Ex: Given: If a figure is a square,  
then it is a quadrilateral. If a figure  
is a quadrilateral, then it is a polygon.

Conjecture: If a figure is a square then it  
is a polygon.

True by law of syllogism

Given: If a number is divisible by 2, then it is even. If a number is even, then it is an integer.

Conjecture: If a number is an integer, then it is divisible by 2.

$r \rightarrow p$

Not true with the Law of syllogism.

