

Deductive reasoning is a process of reasoning using given and previously known facts to reach a logical conclusion.

Definitions }
Theorems }
Postulates }

Law of Detachment

The **Law of Detachment** is a law of logic that states if a conditional statement and its hypothesis are true, then its conclusion is also true.

If... $p \rightarrow q$ and p are true.

Then... q is true.

If an angle is a right angle is a rt \angle then
it has a measure of 90°

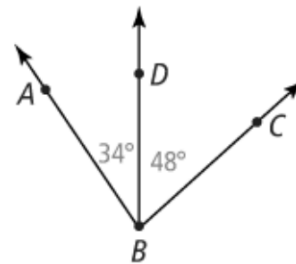
Assume that the set of given information is true.

A. If Alicia scores 85 or greater on her test, she will earn an A as her final grade. Alicia scores 89 on her test. What can you logically conclude?

Alicia gets an A as her
final grade.

Assume that the set of given information is true.

B. If point D is in the interior of $\angle ABC$, then $m\angle ABC = m\angle ABD + m\angle DBC$. What can you logically conclude about $m\angle ABC$?



$$\begin{aligned} m\angle ABC &= 34 + 48 \\ &= 82^\circ \end{aligned}$$

2. Assume that each set of given information is true.

a. If two angles are congruent, then the measures of the two angles are equal to each other. Angle 1 is congruent to $\angle 2$. What can you logically conclude about the measures of $\angle 1$ and $\angle 2$?

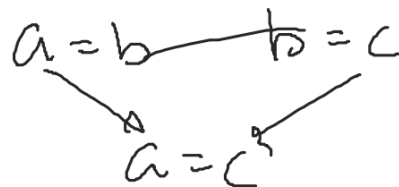
b. If you finish the race in under 30 minutes, then you win a prize. You finished the race in 26 minutes. What can you logically conclude?

Law of Syllogism

The **Law of Syllogism** is a law of logic that states that given two true conditionals with the conclusion of the first being the hypothesis of the second, there exists a third true conditional having the hypothesis of the first and the conclusion of the second.

If... $p \rightarrow q$ and $q \rightarrow r$ are true.

Then... $p \rightarrow r$ is true.



Assume that the set of conditionals is true. What can you conclude using the Law of Syllogism?

A. If Kenji plays the trumpet, then he plays a brass instrument. If he plays a brass instrument, he is a member of the marching band.

If Kenji plays the trumpet, then he is a member of the marching band.

Assume that the set of conditionals is true. What can you conclude using the Law of Syllogism?

B. If points A , B , and C are collinear and B is between A and C , then ~~\overrightarrow{BA} and \overrightarrow{BC}~~ are opposite rays. If ~~\overrightarrow{BA} and \overrightarrow{BC}~~ are opposite rays, then $AB + BC = AC$. What can you conclude?

If points A, B, C are collinear and B is between A and C , then $AB + BC = AC$

b. If it is a holiday, then you don't have to go to school. If it is Labor Day, then it is a holiday.

If you don't have to go to school,
then it is Labor Day!

$$\begin{array}{l} p \rightarrow q \\ \hline q \rightarrow r \end{array}$$

$$p \rightarrow r$$

1.4 & 1.6

V

Reasoning