

Definition of Logic - The principles of Reasoning.

Inductive & Deductive Reasoning

Inductive Reasoning -

Ex. 1) Let's say that every Friday so far this school year, the cafeteria has had chocolate chip cookies for dessert. Knowing that information, what kind of dessert would you think the cafeteria would have this Friday? Chocolate Chip Cookies

Note that inductive reasoning is Specific to general.

Inductive reasoning often leads to a Conjecture.

A conjecture is an educated guess.

Deductive Reasoning - Starts with general idea and uses logic to arrive at a Conclusion.

There are two basic types of logical arguments (i.e., laws of deductive reasoning):

- 1) Detachment Law
- 2) Law of Syllogism

Law of Detachment (General to Specific)

Ex. 2) Given: All Americans are human.

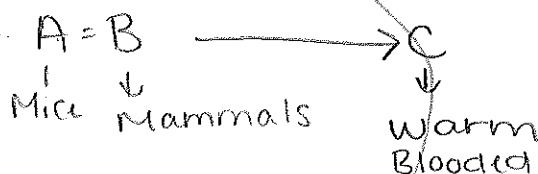
If Kelly is an American, what conclusion can we draw about Kelly?

She is a human

Law of Syllogism (The A=B=C Chain)

Ex. 3) Given: All ^Amice are ^Bmammals. All mammals are ^Cwarm-blooded.

What conclusion can we draw about mice?



Mice are warm Blooded

What conclusion can be drawn based on the given information?

Ex 4) Given: If Jim waters his lawn, his grass grows; and if Jim's grass grows, Jim will have to cut it.

If Jim waters his lawn, what conclusion can we draw?

He will have to cut it

Which law(s) of logic did we use to draw our conclusion?

Silligism

Ex 5) Given: If someone gets their hair cut by Monique, then they will look sharp.

If Carlos just got his hair cut by Monique, what conclusion can we draw?

He looks sharp

Which law(s) of logic did we use to draw our conclusion?

Detachment

Ex 6) Given: All dogs are mammals, and all mammals are vertebrates.

If Shaggy is a dog, what conclusion can we draw?

hes a vertebrates

Which law(s) of logic did we use to draw our conclusion?

Silllogism

Use inductive reasoning to identify the next number in each sequence. Then explain (in words) what pattern the numbers are following.

1. 1, 2, 4, 8, 16, 32 Pattern: Multiply By 2

2. 28, -14, 7, $-\frac{7}{2}$, $\frac{7}{4}$, _____ Pattern: _____

3. $\frac{1}{3}$, 1, $\frac{5}{3}$, $\frac{7}{3}$, 3, _____ Pattern: + 2/3

Decide if the Law of Detachment can be used to draw a valid conclusion from the two given statements. If a conclusion can be drawn, write the conclusion. If no conclusion can be drawn, write "no conclusion" and then explain why no conclusion can be drawn.

4. If a person is a Texan, then he is an American.

Alex is a Texan.

Conclusion: hes American

5. If you play a sport at GMHS, then you must have at least a 1.5 GPA.

Chris plays football at GMHS.

Conclusion: he has 1.5 GPA

6. If two angles form a linear pair, then they are supplementary.

$\angle 3$ and $\angle 4$ are supplementary.

Conclusion: They form a linear pair

Decide if the Law of Syllogism can be used to draw a valid conclusion from the two given statements. If a conclusion can be drawn, write the conclusion. If no conclusion can be drawn, write "no conclusion" and then explain why no conclusion can be drawn.

7. If Hannah lives in Rocky Mount, then Hannah lives in North Carolina.

If Hannah lives in North Carolina, then Hannah lives in the United States.

Conclusion: Hanna lives in USA

8. If Rachel eats pizza, then she eats at Lilli's Pizza.

If Rachel eats pizza, then she eats pepperoni pizza.

Conclusion: Rachel eats Pepperoni pizza

9. If Jared is 18 years old, then he can vote.
If Jared can vote, then he can be drafted in the military.
Conclusion: he can be drafted

For 10-13, decide if the Law of Detachment or the Law Syllogism can be used to draw a valid conclusion from the two given statements. If a conclusion can be drawn, write it and state which law you used. If no conclusion can be drawn, write "no conclusion" and then explain why no conclusion can be drawn.

10. If a figure is a square, then it is a polygon.
Figure A is a polygon.
Conclusion: if a figure is a square its a polygon
Law Used (if no conclusion, explain why): Sillogism

11. If Mitch arrives at school at 7:00am, he will get help in math.
If Mitch gets help in math, then he will pass his math test.
Conclusion: if Mitch gets to school @ 7am he will pass test
Law Used (if no conclusion, explain why): Sillogism

12. If you are a teacher, then you work every day of the week.
If you an entrepreneur, then you work every day of the week.
Conclusion: if youre a teacher you work everyday of week
Law Used (if no conclusion, explain why): Sillogism

13. Right angles are congruent.
 $\angle X$ and $\angle Y$ are right angles.
Conclusion: _____
Law Used (if no conclusion, explain why): Detachment