

- substitution instance
 - an argument that results from *uniformly* replacing the variables in that argument form with statements
- valid argument form
 - a form in which every substitution instance is a valid argument
- formally valid argument
 - one that is valid because of its form
 - if the premises are true, the conclusion must be true!

*necessary truth: a statement that cannot be false

i exist. so, bachelors are unmarried.

-conclusion is a necessary truth – it is valid. the validity has nothing to do with the form and everything to do with the content of the conclusion.

- conditional statement
 - an if-then statement
 - if... [antecedent],
 - then... [consequent]
 - hypothetical
 - can be true even if the antecedent or consequent is false
- antecedent
 - if-clause of a conditional
- consequent
 - then-clause of a conditional
- stylistic variants
 - alternate ways of saying the same thing
 - stylistic variants on “if...then”:
 - given that a, b.
 - assuming a, b.
 - b if a.
 - a is a sufficient condition (enough) for b
 - b given that a.
 - b assuming a.
 - a only if b.
 - b is a necessary condition (requirement) for a
 - $\wedge$ convert to “if...then”
- **modus tollens** (valid)
 - 1. If A, then B.
 - 2. Not B.
 - 3. So, not A.
- **hypothetical syllogism** (valid) $x = y, y = z, x = z$
 - 1. If A, then B.
 - 2. If B, then C.

- find out whether the argument is valid or invalid

negations

p	$\sim p$
T	F
F	T

p: opposite truth value

conjunctions

$p / q \rightarrow p \cdot q$

$T / T \rightarrow T$
 $T / F \rightarrow F$
 $F / T \rightarrow F$
 $F / F \rightarrow F$

$p \cdot q$: always false except when both conjuncts are true

disjunctions

*inclusive disjunction

p / q	$p \vee q$
T / T	T
T / F	T
F / T	T
F / F	F

$p \vee q$: always true except when both disjuncts are false

material conditionals

*if the antecedent is true and the consequent is false, then the conditional as a whole is false

*the material conditional: a type of conditional as being false only when the antecedent is true and the consequent is false

p / q	$p \rightarrow q$
T / T	T
T / F	F
F / T	T