

**Rewrite the definition as a biconditional statement.**

1. A conjecture is an unproven statement that is based on observations.

A statement is a conjecture IFF it is an unproven statement based on observations

2. A counterexample is a specific case for which a given conjecture is false.

An example is a counterexample IFF it is a specific case for which a given conjecture is false.

**Show the conjecture is false by finding a counterexample.**

3. The quotient of two whole number is a whole number.

$$2 \div 3 = \frac{2}{3} (\neq \text{whole } \#)$$

4. The square of any integer is a positive integer.

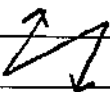
$$0^2 = 0 (\neq \text{positive } \#)$$

**For the given statement, write the *if-then* form, the *converse*, the *inverse*, and the *contrapositive*. Indicate whether each statement is *true* or *false*.**

5. Any two adjacent angles share a common side.

If-then: If two angles are adj., then they share a common side. (T)

Converse: If two angles share a common side, then they are adj. (F)

counterex: 

Inverse: If two angles are NOT adj., then they do not share a common side (F)

Contrapositive: If two angles do NOT share a common side, then they are NOT adj. (T)

Write the statement that follows from the given statements. Indicate whether the *Law of Detachment* or the *Law of Syllogism* was used.

6. If Dr. Klein is well-rested for a surgical procedure, then she operates with precision. Dr. Klein got plenty of sleep to prepare for today's operation.

Dr. Klein will operate w/ precision

Law of Detachment

7. If we don't make any stops, then we'll make it to the stadium by 12:30 P.M. If we make it to the stadium by 12:30 P.M., then we should be in time.

If we don't make any stops, then we should be on time

Law of Syllogism

8. The store manager knows that if tomorrow's sale is not advertised in the newspaper, then the store will lose money. If the newspaper does not receive the order for the advertisement soon enough, then they will not be able to put it in tomorrow's newspaper.

If the newspaper does not receive the order for the ad. soon enough, then the store will lose money

Law of Syllogism

9. If the accused suspect has a valid alibi, then the police will not hold him. The crime occurred at 9:32 A.M. The suspect's place of business confirms that he was working with 22 other people from 7:00 A.M. to 4:00 P.M. on the same day.

The police will not hold the suspect

Law of Detachment