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Notetaking with Vocabulary

For use after Lesson 2.2

2.2

In your own words, write the meaning of each vocabulary term.

conjecture – unproven statement that is based on observations

inductive reasoning – used to find a pattern in specific cases and then write a conjecture for the general case

counterexample – specific case for which the conjecture is false

deductive reasoning – uses facts, definitions, accepted properties, and the laws of logic to form a logical argument

Core Concepts

Inductive Reasoning

A **conjecture** is an unproven statement that is based on observations. You use   
**inductive reasoning** when you find a pattern in specific cases and then write a   
conjecture for the general case.

**Notes:**

Counterexample

To show that a conjecture is true, you must show that it is true for all cases. You   
can show that a conjecture is false, however, by finding just one *counterexample*.   
A **counterexample** is a specific case for which the conjecture is false.

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Notetaking with Vocabulary **(continued)**

Deductive Reasoning

**Deductive reasoning** uses facts, definitions, accepted properties, and the laws of logic to form   
a logical argument. This is different from *inductive reasoning*, which uses specific examples   
and patterns to form a conjecture.

Laws of Logic

Law of Detachment

If the hypothesis of a true conditional statement is true, then the conclusion is also true.

Law of Syllogism

If hypothesis *p*, then conclusion *q*.

If these statements are true,

If hypothesis *q*, then conclusion *r*.

If hypothesis *p*, then conclusion *r*.then this statement is true.

Notes:

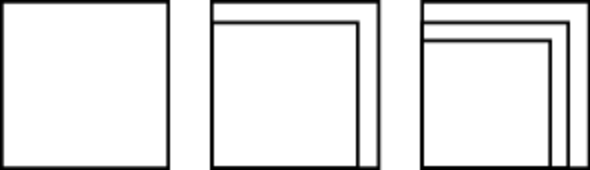
If soccer practice is cancelled, then you can go to the mall after school.

If it is raining today, then soccer practice is cancelled.

Extra Practice

In Exercises 1–4, describe the pattern. Then write or draw the next two numbers, letters, or figures.

1.  2. 

**** 3.  4.

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Notetaking with Vocabulary **(continued)**

In Exercises 5 and 6, make and test a conjecture about the given quantity**.**

5. the sum of two negative integers

6. the product of three consecutive nonzero integers

**In Exercises 7 and 8, find a counterexample to show that the conjecture is false.**

7. If *n* is a rational number, then is always less than *n*.

8. Line *k* intersects plane *P* at point *Q* on the plane. Plane *P* is perpendicular to line *k*.

**In Exercises 9 and 10, use the Law of Detachment to determine what you can conclude from the given information, if possible.**

9. If a triangle has equal side lengths, then each interior angle measure is   
has equal side lengths.

10. If a quadrilateral is a rhombus, then it has two pairs of opposite sides that are parallel.   
Quadrilateral *PQRS* has two pairs of opposite sides that are parallel.

**In Exercises 11 and 12, use the Law of Syllogism to write a new conditional statement that follows from the pair of true statements, if possible.**

11. If it does not rain, then I will walk to school.

If I walk to school, then I will wear my walking shoes.

12. If 

If 