

Pop Quiz
09/07/2011

- 1. Define inductive reasoning.**
- 2. Define a conjecture.**
- 3. Define a counterexample.**

Bellwork

09/07/2011

1. Describe a pattern in the numbers. Write the next number in the pattern: 20, 22, 25, 29, 34,...

Add consecutive #'s starting w/2

40

Geometry

2.2 Analyze Conditional Statements

Standard(s): 8

Vocabulary:

- Conditional Statement:** A logical statement that has two parts, a *hypothesis* and a *conclusion*.

A conditional statement is a logical statement that has two parts, a *hypothesis* and a *conclusion*. When a conditional statement is written in if-then form, the "if" part contains the hypothesis and the "then" part contains the conclusion. Here is an example:

If it is raining, then there are clouds in the sky.

Hypothesis
Conclusion

- If-then Form:** "if" part contains the hypothesis, "then" part contains the conclusion.

Ex. If I find a cat, then I'll name him Phi.

- Negation:** The *opposite* of the original statement (put the word 'not' in front of the hypothesis and conclusion).

- Equivalent Statements:** When two statements are both true or both false.

- Perpendicular Lines:** Two lines that intersect to form a right angle.

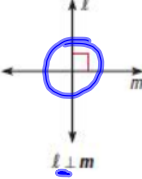
KEY CONCEPT *For Your Notebook*

Perpendicular Lines

Definition If two lines intersect to form a right angle, then they are perpendicular lines.

The definition can also be written using the converse: If two lines are perpendicular lines, then they intersect to form a right angle.

You can write "line l is perpendicular to line m " as $l \perp m$.



- Biconditional Statement:** A statement that contains the phrase "if and only if" (means both the if-then and it's converse are true).

Ex. I will name him Phi, if and only if I find a cat.

- Converse:** The hypothesis and conclusion switch places.

Ex. If I name him Phi, then I found a cat.

- Inverse:** Negation of both the hypothesis and conclusion.

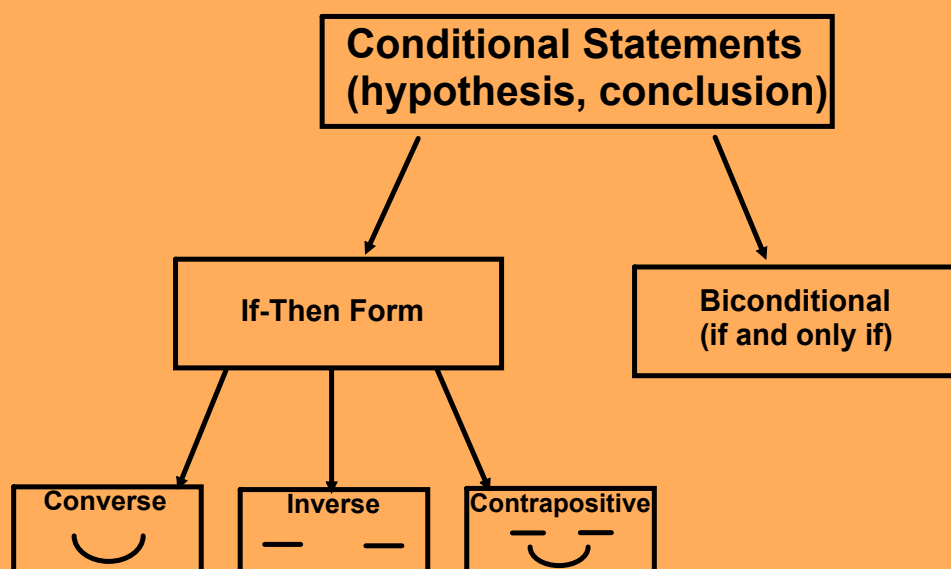
Ex. If I don't find a cat, then I won't name him Phi.

- Contrapositive:** Both the converse and inverse of a statement.

Ex. If I don't name him Phi, then I didn't find a cat.

Logic Statements

Here's an organized visual of conditional statements.



Rewrite a Statement in If-Then Form

Rewrite the conditional statement in if-then form.

- A. All 90° angles are right angles.

If all \sphericalangle 's are 90° , then they are right \sphericalangle 's.

- B. $2x+7=1$, because $x=-3$

If $2x+7=1$, then $x=-3$.

- C. When $n=9$, $n^2=81$

If $n=9$, then $n^2=81$.

- D. Tourists at the Alamo are in Texas.

If there are tourists at the Alamo, then they are in Texas.

Write Four Related Conditional Statements

Write the if-then form, the converse, the inverse, and the contrapositive of the statements. Decide whether each statement is true or false.

Soccer players are athletes.

If-Then:

If they are soccer players, then they are athletes.

Converse:

If they are soccer players, then they are athletes.

Inverse:

If they aren't soccer players, then they aren't athletes.

Contrapositive:

If they aren't athletes, then they aren't soccer players.

If ,then

**there are
there aren't
soccer players**

**they are
they aren't
athletes**

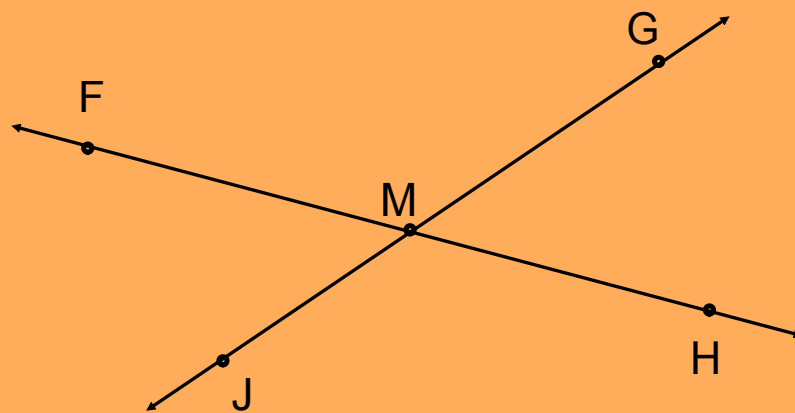
If water is frozen, then its temperature is below 0°C.

If ,then

**the water is
the water isn't
frozen
the temperature is
the temperature isn't
below 0°C**

Use Definitions

Use the diagram shown. Decide whether each statement is true.



- A. $\angle JMF$ and $\angle FMG$ are supplementary. *True*
- B. Point M is the midpoint of \overline{FH} . *False*
- C. $\angle JMF$ and $\angle HMG$ are vertical angles. *True*
- D. $\overline{FH} \perp \overline{JG}$ *False*
 $\overline{FH} \perp \overline{JG}$

Write a Biconditional

Write the converse of the statement. If the converse is also true, write a biconditional statement.

1. converse + true?
2. Drop the if & then
3. add if & only if @ the comma

Supplementary Angles: ~~If two angles are supplementary, then their sum is 180° .~~

Converse: If 2 \angle 's sum is 180° , then they are supplementary.

BC: 2 \angle 's are supplementary if & only if their sum is 180° .

The midpoint of a segment: If a point divides a segment into two congruent segments, then it is a midpoint of the segment.

Converse:

Homework Assignment

Worksheet 2.2B

