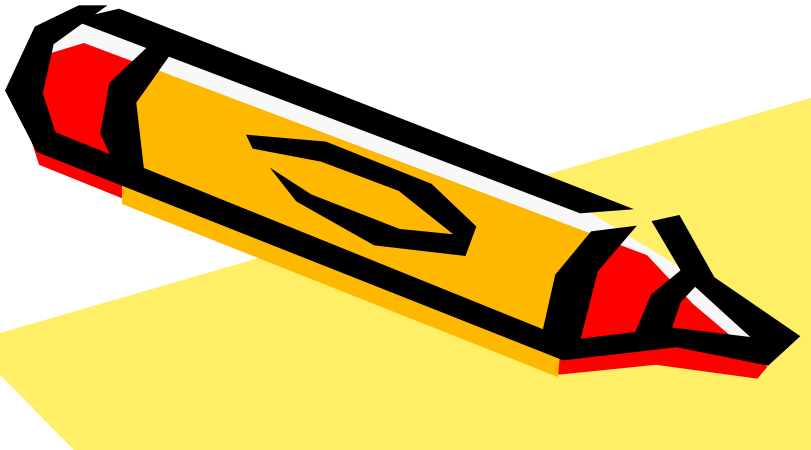
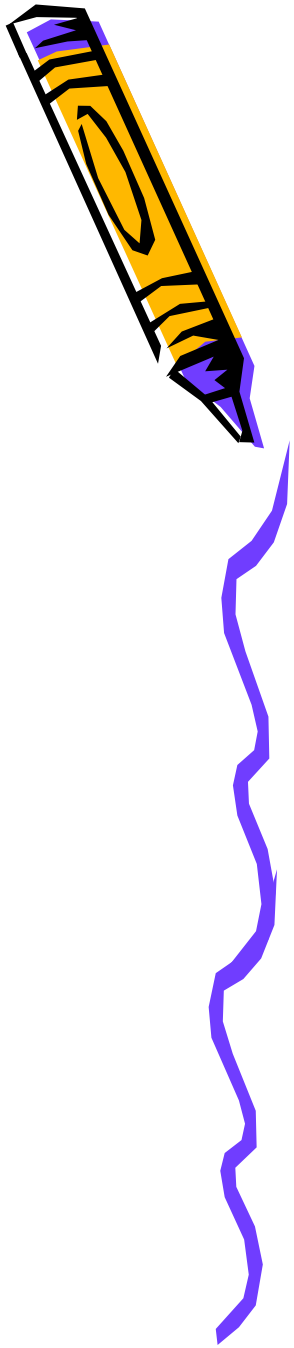


Geometry

If - Then Statements and Postulates

Vocabulary



- Conditional Statement (p -> q):

  p represents the hypothesis

  q represents the conclusion

A logical statement with two parts.

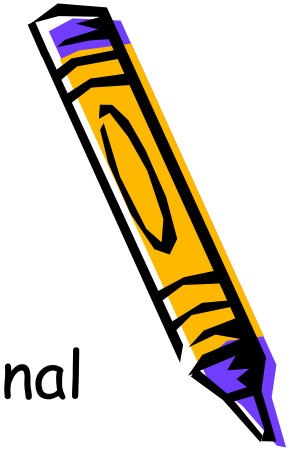
If hypothesis, then conclusion.

For example:

If an animal is a bird,

then it has feathers.

Vocabulary



- Hypothesis:

  The conditional (If) part of a conditional statement.

- Conclusion:

  The resultant (then) part of a conditional statement.

For example (If p, then q):

If an animal is a bird, then it has feathers.

hypothesis conclusion

Identify the Hypothesis and Conclusion in the following. Then determine if each conclusion is true.

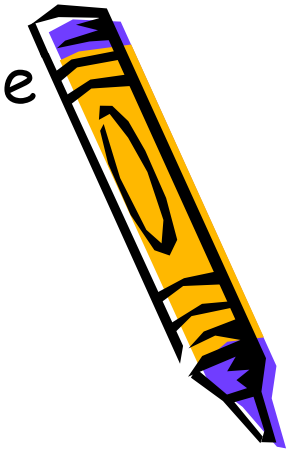
1. If you don't know where you are going, then there is a good chance you will get lost.

2. If it is raining outside, then the game will be cancelled.

3. If an angle measures 90 degrees, then it is a right angle.

4. If the figure is a square, then it has 4 sides.

Write the conditional statement for each of the following. Identify the hypothesis and conclusion in order to verify your conditional statement matches the given statement.



1. I will buy pizza for the winning team.

2. The garbage is picked up on Monday.

3. Quadrilaterals have 4 sides.

Converse of the Conditional

- Conditional (p -> q):

  If hypothesis, then conclusion.

- In the Converse, the hypothesis and conclusion are exchanged:
  - Converse (q -> p):

    If conclusion, then hypothesis.

The Converse of a true statement is not necessarily true.

Converse (q -> p)

Examples:

- conditional (p -> q):

If an animal is a bird, then it has feathers.

- converse (q -> p):

If an animal has feathers, then the animal is a bird.

- conditional (p -> q):

If it is raining, then the game is cancelled.

- converse (q -> p):

If the game is cancelled, then it is raining.

Converse

Examples:

- conditional (p -> q):

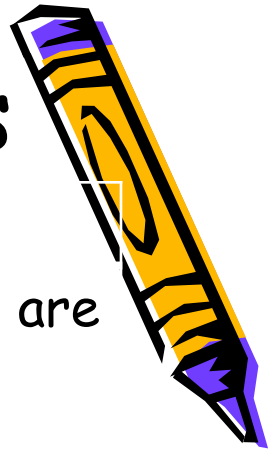
If the triangle is a right triangle,
then the Pythagorean Theorem ($a^2 + b^2 = c^2$) is true.

- converse (q -> p):

Related Conditional Statements

Conditional	If p, then q.	p -> q
Converse	If q, then p.	q -> p
Inverse	If not p, then not q.	~ p -> ~ q
Contrapositive	If not q, then note p.	~ q -> ~ p

Related Conditional Statements



Conditional — If you are in Geometry class, then you are in math class.

Converse

Inverse

Contrapositive

Biconditional Statements

If and only if p <-> q

Definitions are biconditional statements.
Both the conditional and the converse are true.

If the angle is a right angle, then it measures 90 degrees.

If the angle measures 90 degrees, then it is a right angle.

The angle is a right angle **<u>if and only if</u>**
it measures 90 degrees.