Vocabulary

- Conditional Statement – statement that can be written in if-then form
- Converse – formed by exchanging the hypothesis and conclusion of the conditional statement
- Inverse – negating both the hypothesis and conclusion
- Contrapositive – negating the hypothesis and conclusion of the converse
- Logically Equivalent – statements that have the same truth value

### Example 1: Identify the Hypothesis and Conclusion

Identify the hypothesis and conclusion of each conditional statement.

1) If the forecast is rain, then I will take an umbrella.
   a. Hypothesis:
   b. Conclusion:

2) A number is divisible by 10 if its last digit is a 0.
   a. Hypothesis:
   b. Conclusion:

3) If a polygon has six sides, then it is a hexagon.
   a. Hypothesis:
   b. Conclusion:

4) Another performance will be scheduled if the first one is sold out.
   a. Hypothesis:
   b. Conclusion:
Example 2: Write a Conditional in If-Then Form

Identify the hypothesis and conclusion for each conditional statement. Then write the statement in if-then form.

1) A mammal is a warm-blooded animal.
   a. Hypothesis:
   b. Conclusion:
   c. If-Then Form:

2) A prism with bases that are regular polygons is a regular prism.
   a. Hypothesis:
   b. Conclusion:
   c. If-Then Form:

3) Four quarters can be exchanged for a $1 bill.
   a. Hypothesis:
   b. Conclusion:
   c. If-Then Form:

4) The sum of the measures of two supplementary angles is 180.
   a. Hypothesis:
   b. Conclusion:
   c. If-Then Form:

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Notice that a conditional is false only when its hypothesis is true and its conclusion is false.

To show that a conditional is true, you must show that for each case when the hypothesis is true, the conclusion is also true. To show that a conditional is false, you only need to find one counterexample.
Example 3: Truth Values of Conditionals

Determine the truth value of each conditional statement.

1) If you divide an integer by another integer, the result is also an integer.

2) If next month is August, then this month is July.

3) If a triangle has four sides, then it is concave.

4) If \( \angle A \) is an acute angle, then \( m\angle A \) is 35.
Example 4: Related Conditions

Write the converse, inverse, and contrapositive of the following true statement.

1) Lions are cats that can roar.
   a. Conditional:
   b. Converse:
   c. Inverse:
   d. Contrapositive:

2) Two angles that have the same measure are congruent.
   a. Conditional:
   b. Converse:
   c. Inverse:
   d. Contrapositive: