Conditional Statements

**Conditional statement** – a statement that can be written in *if-then* form

If **hypothesis**, then **conclusion**.

**Example 1:** Identify Hypothesis and conclusion

a. If points A, B, and C lie on line \( l \), then they are collinear.
   
   **Hypothesis:** points A, B, C lie on line \( l \)
   
   **Conclusion:** they are collinear

b. The Tigers will play in the tournament if they win their next game.
   
   **Hypothesis:** if the Tigers win their next game
   
   **Conclusion:** the Tigers will play in the tournament

**Example 2:** Write a conditional in if-then form

a. An angle with a measure greater than 90\(^\circ\) is an obtuse angle.
   
   **Hypothesis:** an angle with a measure greater than 90\(^\circ\)
   
   **Conclusion:** it is an obtuse angle

   Write if-then form: *If an angle has a measure greater than 90\(^\circ\), then it is an obtuse angle.*

b. The length of the course for an in-line skating marathon is 26.2 miles.
   
   **Hypothesis:** a course for an in-line skating marathon
   
   **Conclusion:** it is 26.2 miles

   Write if-then form: *If a course is for an in-line skating marathon, then it is 26.2 miles.*
Truth Value of Conditional Statements

Example: Determine the truth value (True or False) of each statement for the set of conditions.

*If you get 100% on your test, then your teacher will give you an A.*

a. You get 100%; your teacher gives you an A.

H: True
C: True

b. You get a 100%; your teacher gives you a B.

H: True
C: False

Because the H is False, you don’t know what will happen.

c. You get 98%; your teacher gives you an A.

H: False
C: True

Because the H is False, you don’t know what will happen.

d. You get 85%; your teacher gives you a B.

H: False
C: True

Because the H is False, you don’t know what will happen.

Related Conditional Statements: Every conditional statement involves two scenarios (hypothesis and conclusion). Switching and/or negating these scenarios creates three related conditional statements (converse, inverse, and contrapositive).

Original Statement: *If you live in Salem NH, then you live in the United States.*

Converse: switch hypothesis and the conclusion

If you live in the U.S., then you live in Salem, NH.

Inverse: negate (make “not” or opposite) the hypothesis AND conclusion

If you don’t live in Salem, NH, then you don’t live in the U.S.

Contrapositive: negate AND switch the hypothesis and conclusion

If you don’t live in the U.S., then you don’t live in Salem, NH.

Sheet 23 #1-3