Conditional Statement

Also known as the *if-then* statement.

Two parts:

1. Hypothesis

2. Conclusion

If **hypothesis** then **conclusion**

Example:

If it is raining then water is falling from the sky.

Hypothesis: it is raining

Conclusion: water is falling from the sky

Example – pg 68, Check Understanding 1

If y – 3 = 5 then y = 8

<u>Hypothesis</u>: y – 3 = 5

<u>Conclusion</u>: y = 8

Writing a conditional

1. Break statement into two parts.

2. Determine subject of 1st part, turn into general reference

3. First part becomes the hypothesis

4. Second part becomes the conclusion

Example – pg 71, #12

All obtuse angles have measure greater than 90.

1<u>st</u> part: all obtuse angles

→ subject is obtuse angles

→ an angle is an obtuse angle

2<u>nd</u> part: have a measure greater than 90

If **an angle is an obtuse angle** then **it has a measure greater than 90**

Truth value of a conditional

Either true or false

The answer to the question "is the conditional true?"

Example – pg 72, #18

If you play a sport with a ball and a bat then you are playing baseball.

Counter-example:

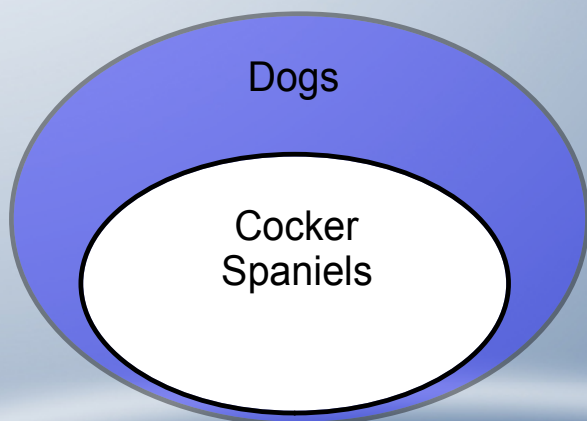Think of a sport that uses a ball and bat but isn't baseball…

Softball or Cricket

Venn Diagrams

Way to visualize a conditional

Hypothesis is the inner circle

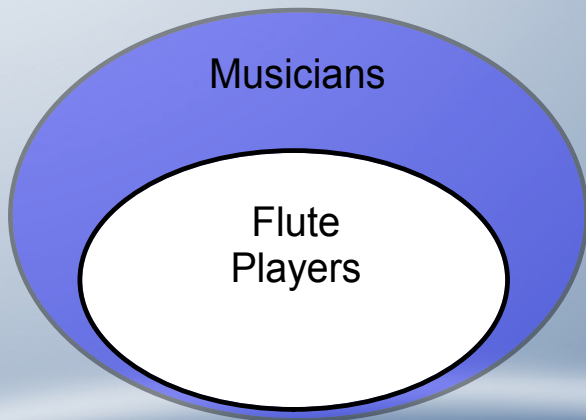Conclusion is the outer circle

Dogs

Cocker
Spaniels

If something is a cocker spaniel,

then it is a dog.

Example – pg 72, #20

Make a Venn diagram for this conditional:

If you play the flute then you are a musician.

Converse of a conditional

Swap the hypothesis and conclusion.

Conclusion may not be true

Always check truth value of both

Example – pg 72, #28

Conditional:

    If a point is in the 1st quadrant then its coordinates are positive.

Converse:

    If a point's coordinates are positive then it is in the 1st quadrant.

Truth values:

Conditional: true

Converse: true

Example

Conditional:

    If it is raining then water is falling from the sky.

Converse:

    If water is falling from the sky then it is raining.

Truth values:

Conditional: true

Converse: false (counter-example: spraying water from a hose)

Symbols

$p \rightarrow q$ means if p then q

Often see:

Let p: The point is in the 1$^{\text{st}}$ quadrant

Let q: The point's coordinates are positive

$p \rightarrow q$ (the conditional)

$q \rightarrow p$ (the converse)

Postulates as conditionals

First state Postulate 1-2 as a statement, then as a conditional:

Statement:

Two intersecting lines meet in exactly one point.

Conditional:

If two lines intersect then they meet in exactly one point.