2 - 3
Conditional Statements

conditional statement: written in "if - then" form

How it is written:

$$P \longrightarrow q$$ "if p, then q"

"p implies q"

hypothesis: phrase after "if"

conclusion: phrase after "then"

Identify the hypothesis and conclusion in the following statements.

Ex: If points A, B, and C lie on line ℓ, then they are collinear.

Ex: The Redskins will make the playoffs if they finish the season 10-0.

Write each of the following in "if-then" form.

Ex: An angle ~~with~~ *has* a measure greater than 90° is an obtuse angle.

If ... *, then it*

Ex: Perpendicular lines intersect.

If two lines are perpendicular, then they intersect.

Determine the truth value of the following statement for each set of conditions.

If you get 100% on your test, your teacher gives you an A.

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

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

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

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

Truth Table

Conditional Statements

p	q	p → q
T	T	T
T	F	F
F	T	T
F	F	T

*** Only F when T→F

Conditional

Formed by... given H and C

Symbols $p \rightarrow q$

Converse

Formed by... switch the H and C

Symbols $q \rightarrow p$

Inverse

Formed by... negate the H and C

Symbols $\sim p \rightarrow \sim q$

Contrapositive

Formed by... negate and switch H and C

Symbols $\sim q \longrightarrow \sim p$

Truth Table

p	q	Conditional $p \rightarrow q$	Converse $q \rightarrow p$	Inverse $\sim p \rightarrow \sim q$	Contrapositive $\sim q \rightarrow \sim p$
T	T	T	T	T	T
T	F	F	T	T	F
F	T	T	F	F	T
F	F	T	T	T	T

logically equivalent: statements with the same truth value

Example: conditional/contrapositive

converse/inverse

Write the converse, inverse, and contrapositive of the statement
                    "All squares are rectangles."

Conditional... If a shape is a square,
(T) then it is a rectangle.

Converse... If a shape is a rectangle,
(F)   then it is a square.

Inverse... If a shape is not a square,
(F) then it is not a rectangle.

Contrapositive... If a shape is not a
(T) rectangle, then it is not a square.

Homework:

2-3 WS