

1.8

Wednesday, August 17, 2016 9:12 AM

1.8 Statements of Logic

Ex 1: Write the following declarative sentences in conditional form:

- Two right angles are congruent.
If two angles are right angles, then they are \cong .
- Hinsdale Central school colors are red and white.
If the school is HC, then the colors are red and white.

Write the CONVERSE of the statements above.

- If two angles are \cong , then they are right angles. **F**
- If the school colors are red and white, then the school is HC. **F**

The INVERSE of a conditional statement negates both the hypothesis and conclusion.

- If two angles are NOT right angles, then they are NOT \cong . **F**
- If the school is NOT HC, then the school colors are NOT red + white. **F**

The CONTRAPOSITIVE switches and negates both the hypothesis and conclusion.

- If two angles are NOT \cong , then they are NOT right angles. **T**
- If the school colors are NOT red + white, then the school is NOT HC. **T**

Conditional	$P \rightarrow Q$	T
Inverse	$\neg P \rightarrow \neg Q$	F
Converse	$Q \rightarrow P$	F
Contrapositive	$\neg Q \rightarrow \neg P$	T

Ex. 2 Coca Cola has caffeine.

- T Conditional: If a drink is Coca Cola, then it has caffeine.
- F Inverse: If a drink is NOT Coca Cola, then it does NOT have caffeine.
- F Converse: If a drink has caffeine, then it is Coca Cola.
- T Contrapositive: If a drink does NOT have caffeine, then it is NOT Coca Cola.

Chain of Reasoning:

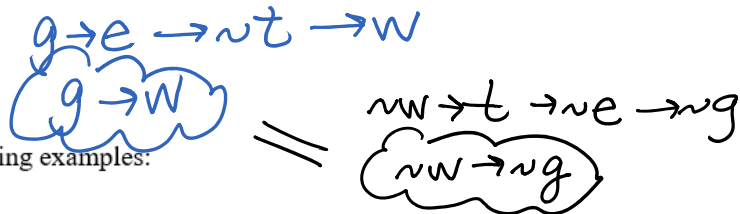
Ex. 3

If gremlins grow grapes, then elves eat earthworms.
 If trolls don't tell tales, then wizards weave willows.
 If trolls tell tales, then elves won't eat earthworms.

$g \rightarrow e$ $ne \rightarrow ng$
 $\sim t \rightarrow w$ $\sim w \rightarrow t$
 $t \rightarrow ne$ $e \rightarrow \sim t$

We can conclude:

It doesn't matter where you start!



Make a conclusion from the following examples:

Ex. 4

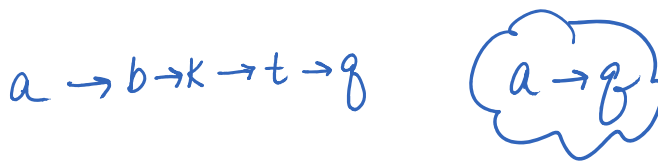
$m \rightarrow z$
 $\sim b \rightarrow q$
 $z \rightarrow \sim b$



Ex. 5

$\sim k \rightarrow \sim b$
 $\sim q \rightarrow \sim t$
 $a \rightarrow b$
 $k \rightarrow t$

$b \rightarrow k$
 $t \rightarrow q$
 $\sim b \rightarrow \sim a$
 $\sim t \rightarrow k$



Ex. 6

$\sim v \rightarrow \sim z$
 $v \rightarrow b$
 $\sim h \rightarrow \sim c$
 $\sim c \rightarrow \sim b$
 $w \rightarrow z$

$z \rightarrow v$
 $\sim b \rightarrow \sim v$
 $c \rightarrow h$
 $b \rightarrow c$
 $\sim z \rightarrow \sim w$

