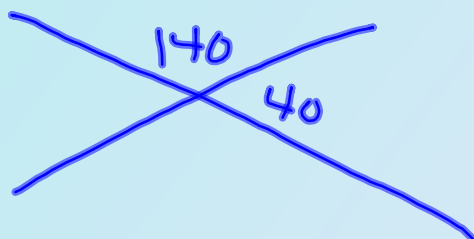Do-now: TURN IN FRACTAL ESSAY

Is the following statement true or false? How do you know?

T   F

If two lines intersect, then they must be perpendicular.

140

40

COUNTEREXAMPLE:

An example that proves a statement false.

1. Examine the four sets of conditionals on your handout.

2. Determine the truth value of the original conditional and the new conditional.

3. Identify what changes took place to create the new conditional and apply those changes to the two examples at the bottom of the page. Determine the truth value of each.

Investigation #1: How did the conditionals change?

CONVERSE

The hypothesis and the conclusion switch places.

A conditional and its converse do not necessarily have the same truth value.

Investigation #2: How did the conditionals change?

INVERSE

The hypothesis and the conclusion are negated.

Not necessarily the same truth value

Investigation #3: How did the conditionals change?

CONTRAPOSITIVE

The hypothesis and the conclusion are negated and switch places.

(Converse & inverse!)

A conditional and its contrapositive always
have the same truth value.

means

LOGICALLY EQUIVALENT!

<u>LOGIC NOTATION</u>

If _____ P _____ , then _____ q _____ .

$$P \rightarrow q$$

"p implies q"

Original Conditional	$P \rightarrow q$
Converse	$q \rightarrow P$
Inverse	$\sim P \rightarrow \sim q$
Contrapositive	$\sim q \rightarrow \sim P$

$\sim$ = "not", opposite, negation

"Then you should say what you mean", the March Hare went on.

"I do," Alice hastily replied; "at least -- at least I mean what I say -- that's the same thing, you know."

"Not the same thing a bit!" said the Hatter, "Why, you might just as well say that 'I see what I eat' is the same thing as 'I eat what I see'!"

"You might just as well say," added the March Hare, "that 'I like what I get' is the same thing as 'I get what I like'!"

"You might just as well say," added the Dormouse, who seemed to be talking in his sleep, "that 'I breathe when I sleep' is the same thing as 'I sleep when I breathe'!"

"It is the same thing with you," said the Hatter, and here the conversation dropped, and the party sat silent for a minute.