Name: _____/

Mr. Fruzzetti's Geometry Class

If-Then Conditionals

Statement 1:

"If $m\measuredangle ABC = 37°$, then $\measuredangle ABC$ is an acute angle."

a) What is the *hypothesis* of the statement? _____

b) What is the *conclusion* of the statement? _____

Given that the **inverse** of a conditional statement means *negating* both the hypothesis (first or "if" part) and conclusion (second or "then" part), write the inverse of Statement 1:

_____

Disprove the inverse of Statement 1 by using a counterexample:

_____

Given that the **converse** of a conditional statement means *reversing* the hypothesis (first part) and conclusion (second part), write the converse of Statement 1:

_____

Disprove the converse of Statement 1 by using a counterexample:

_____

Given that the **contrapositive** of a conditional statement means *reversing and negating* both the hypothesis (first part) and conclusion (second part), write the contrapositive of Statement 1:

_____

If Statement 1 is true, is its contrapositive also true? _____

Do you think this is always the case? _____

As it turns out, if a conditional statement is true, its contrapositive *is* also true, but its inverse and converse may not be true. Become familiar with this vocabulary; it will be on your tests. These statements are often written in shorthand as follows: $m\measuredangle ABC = 37° \Rightarrow \measuredangle ABC$ is acute. The arrow pointing from left to right means that the left side of the arrow is the hypothesis and the right side is the conclusion.

On the other side of this sheet you will meet biconditional statements, which are often written using the term "if and only if" or the shorthand word "iff."

Name: _____/

Mr. Fruzzetti's Geometry Class

If-And-Only-If Biconditionals

Statement 2:

"A number is divisible by 10 if and only if its last digit is a zero."

a) What is the *hypothesis* of the statement? _____

b) What is the *conclusion* of the statement? _____

Given that the **inverse** of a conditional statement means *negating* both the hypothesis (first or "if" part) and conclusion (second or "then" part), write the inverse of Statement 2:

_____

Try to disprove the inverse of Statement 2 by using a counterexample:

_____

Given that the **converse** of a conditional statement means *reversing* the hypothesis (first part) and conclusion (second part), write the converse of Statement 2:

_____

Try to disprove the converse of Statement 2 by using a counterexample:

_____

Given that the **contrapositive** of a conditional statement means *reversing and negating* both the hypothesis (first part) and conclusion (second part), write the contrapositive of Statement 2:

_____

If Statement 2 is true, is its contrapositive also true? _____

If Statement 2 is true, is its inverse also true? _____

If Statement 2 is true, is its converse also true? _____

Would the inverse, converse, and contrapositive of Statement 2 be true or false if Statement 2 itself were false?

_____

These biconditional statements are often written using one of the two following shorthand methods:

1) "A number is divisible by 10 iff its last digit is a zero."
2) "A number is divisible by 10 $\Leftrightarrow$ its last digit is a zero."

Get familiar with this vocabulary!