

S-G Geometry Session 4 6/21

Conditional Statements "If... then"

**If** <sup>hypothesis</sup> you call your mom "chunky", then you will die a painful death.

Good definition - must be true both forwards and backwards <sup>conclusion</sup>

Converse - switch the order of the hypothesis and conclusion.

If you die a painful death, then you called your mom "chunky". false

Counterexamples: This class.

**If** <sup>hypothesis</sup> you watch a Marvel movie, **then** you should stay for the end credits. <sup>conclusion</sup>

Converse: If you stay for the end credits, then you are watching a Marvel movie.  
false

If you are <sup>hypothesis</sup> in the presence of Nate, then you are in the presence of the smartest person alive.  
Conclusion

Converse:

If you are in the presence of the smartest person alive, then you are in the presence of Nate.

True!

Biconditional Statement → a good definition.

No if you are in the presence of the smartest person alive if, and only if you are in the presence of Nate No then

Connect two statements with "if, and only if",  
order does not matter!

I identify hypothesis and conclusion. Write converse  
If the converse is true, then write the biconditional statement. (if, and only if)

1.) If you are <sup>hypothesis</sup> eating an orange, then you are eating something disgusting. <sup>conclusion</sup>

Converse: If you are eating something disgusting, then you are eating an orange false  
counterexample: oysters, pickles, olives, melon,

2.) If you are <sup>hypothesis</sup> in Geometry class, then you are looking at Nate's hideous face. <sup>conclusion</sup>

Converse: If you are looking at Nate's hideous face, then you are in Geometry class.

3.) If it is <sup>hypothesis</sup> July 4<sup>th</sup>, then it is <sup>false</sup> Independence Day. <sup>conclusion</sup>

Converse: If it is Independence Day, then it is

Biconditional July 4<sup>th</sup> true  
It is Independence Day if, and only if, it is July 4<sup>th</sup>.

4.) If  $n = 8$ , then  $n^2 = 64$

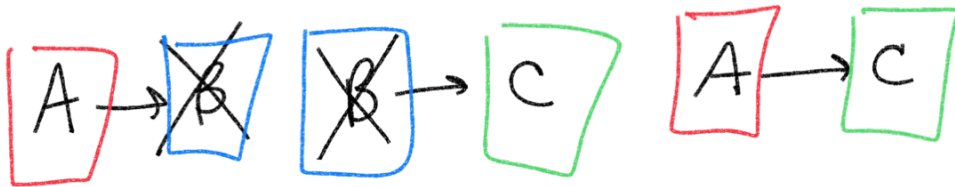
Converse If  $n^2 = 64$ , then  $n = 8$

Counterexample  $n = -8$  false

If you make fun of Nate, then he will be sad.

If Nate is sad, then he will eat eight dozen donuts.

Law of Syllogism (Transitive Property)



Sophia made fun of Nate

Nate will eat eight dozen donuts.

If you eat shrimp, then you may eat the "vein".

If you eat the "vein", then you are eating poop.

Law of Syllogism

If you eat shrimp, then you are eating poop.

# Law of Detachment

If you are a math teacher,

hypothesis

then you are a sad... sad... oh so sad and lonely person.

conclusion

If you're given the hypothesis, then you  
⇒ can return the conclusion

If you're given the conclusion, then you  
cannot return the hypothesis.

1.) Cooper is a teacher

He is a sad, lonely person.

2.) Ben is a sad, sad, ... oh so sad and lonely person

no conclusion

If it is Friday night, then Sophia is at a party.

— I just saw Sophia at a party  
no conclusion

— Tonight is Friday night  
Sophia is at a party.