

Designate letters to represent the propositions within the following argument, then list both the steps and reasons for those steps. Establish the validity of the argument using our rules of inference.

My cat Pythagoras treats my other cat Theta well and Pythagoras is not paranoid. If Pythagoras treats Theta well, then he does not understand the concept of mathematical induction. It has been established that Pythagoras does understand mathematical induction or he cusses like a sailor. If my cat Pythagoras does not rule the world, then he knows what a right angle is and won't cuss like a sailor. Therefore, Pythagoras will rule the world.

Let t represent: Pythagoras treats Theta well,
 p represent: Pythagoras is paranoid,
 m represent: Pythagoras understands the concept of mathematical induction,
 c represents: Pythagoras cusses like a sailor,
 r represents: Pythagoras will rule the world, and
 a represents: Pythagoras knows what a right angle is.

<u>Steps:</u>	<u>Reasons:</u>
1. $t \wedge \neg p$	Premise
2. t	Conjunctive Simplification
3. $t \rightarrow \neg m$	Premise
4. $\neg m$	Modus Ponens
5. $m \vee c$	Premise
6. c	Disjunctive Syllogism
7. $\neg r \rightarrow (a \wedge \neg c)$	Premise
8. $c \vee \neg a$	Disjunctive Amplification
9. $\neg a \vee c$	Commutativity
10. $\neg a \vee \neg \neg c$	Double Negation
11. $\neg(a \wedge \neg c)$	DeMorgan's Law
12. $\neg \neg r$	Modus Tollens
13. $\therefore r$	Double Negation