

Hello

1 Part 1

In step 3 of the proof, the disjunctive syllogism is used to deduce that Y is false.

Disjunctive syllogism is a rule of inference that allows one to deduce a disjunct from a false disjunction and any proposition that is equivalent to the negation of one of its disjuncts. It can be expressed as "If P or Q is false and P is false, then Q is false."

In this proof, we can see that the disjunction is $(X \text{ or } Y)$ and it's false, that means that neither X nor Y is true. By using that information and the fact that we know that X is false, we can conclude that Y is false as well.

In other words, in this proof, we are using $(X \text{ or } Y)$ is false as the premise and $(X \text{ is false})$ as the equivalent of the negation of one of the disjuncts (X) to deduce that Y is false.