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PHILOS 12A / DIS 102

GSI: Mathias Boehm

Problem Set #6

Exercise 6.26

The start of the proof is with two premises: $A \vee (B \wedge C)$ and $\neg B \vee \neg C \vee D$ with the goal of getting to $A \vee D$. By looking at the conclusion, it can be acknowledged that it is a disjunction, so in order to receive this end result, proof by cases is sufficient.

Beginning the proof is a subproof with the assumption being $\neg B$. A is reiterated through a subproof. Through another subproof is the assumption $(B \wedge C)$. From there, there is another subproof with the assumption $\neg A$. Under this subproof, B can be a step, which proves a contradiction with the original assumption. Because of this, $\neg\neg A$ is a valid step. After ruling \neg Elimination, $\neg\neg A$ turns into A . The next step would then be $A \vee D$ by \vee Intro. This is the end of the $\neg B$ subproof.

Next would be $\neg C$. It essentially follows the same steps with except of substituting C for B . It would follow the reiteration, elimination, and intros. Because of this, the final steps for the $\neg C$ subproof would be $A \vee D$ by \vee Intro.

D is different. D is the assumption, and $A \vee D$ is valid through \vee Intro. Because there is a $A \vee D$ in all three cases, the final conclusion of $A \vee D$ is proved.