

3.

Let EF represent “The Earth is flat.”

Let SC represent “I am Santa Claus.”

Let MC represent “The Moon is made of cheese.”

Given

$$EF \rightarrow SC \equiv \neg EF \vee SC \quad \text{is True}$$

Need to Prove

$$\begin{aligned} & (SC \rightarrow MC) \rightarrow (EF \rightarrow MC) \\ \equiv & (\neg SC \vee MC) \rightarrow (\neg EF \vee MC) \\ \equiv & \neg(\neg SC \vee MC) \vee (\neg EF \vee MC) \\ \equiv & (SC \wedge \neg MC) \vee (\neg EF \vee MC) \\ \equiv & (SC \wedge \neg MC) \vee MC \vee \neg EF \\ \equiv & (SC \vee MC) \wedge (\neg MC \vee MC) \vee \neg EF \\ \equiv & (SC \vee MC) \wedge T \vee \neg EF \\ \equiv & (SC \vee MC) \vee \neg EF \\ \equiv & SC \vee MC \vee \neg EF \\ \equiv & SC \vee \neg EF \vee MC \\ \equiv & T \vee MC \quad (\text{Since } SC \vee \neg EF \equiv \neg EF \vee SC \text{ is given to be True}) \\ \equiv & T \end{aligned}$$

Hence “I am Santa Claus implies that the Moon is made of cheese, only if the Earth is flat implies that the Moon is made of cheese” is proven to be True.