Part 4 (a)

Given $(A \vee B, \sim A) \vdash B$

To prove Soundness, we use Truth Table Method

A	B	$\sim A$	$A \vee B$	KB	$KB \wedge \sim B$
T	T	F	T	F	F
T	F	F	T	F	F
F	T	T	T	T	F
F	F	T	F	F	F

This inference is Sound because $KB \wedge \sim B$ column is always false (or, alternately, every world where KB is true, B is true)

It is not Complete by itself. It can't do Case analysis and can't show that $\begin{pmatrix} A \Rightarrow B \\ \sim A \Rightarrow B \end{pmatrix} \vdash B$

To Show that this is a Special Case of resolution, we use resolution rule on the antecedents and derive Consequents

$\underline{A \vee B} \quad \underline{\sim A}$

B derived by resolution

$M \supset I$	(1) $\sim M \lor I$	M	Mythical
$\sim M \supset \sim I \land Mm$	(2) $\sim M \lor \sim I$	I	Immortal
	(3) $\sim M \lor Mm$	Mm	Mammal
$I \lor Mm \supset H$	(4) $\sim I \lor H$	H	Horned
	(5) $\sim Mm \lor H$		
$H \supset Mg$	(6) $\sim H \lor Mg$	Mg	Magical

Easy to Prove Horned (and thus Magical)

Cannot Prove Mythical

I will show how to Prove Magical by Resolution Refutation

so we assume $\sim Mg$ and derive ~~neg~~ empty clause