Subject 24.244. Modal Logic. Problem set due Thursday, November 5.
In these problem, $(\varphi \to \psi)$ is the material conditional. It's true if either φ is false or ψ is true.
$(\varphi > \psi)$ is the Stalnaker conditional. It's true if ψ is true in the closest world (if there is one) where φ is true.

1.   Show that the transitivity schema, $(((\varphi > \psi) \wedge (\psi > \theta)) \to (\varphi > \theta))$ doesn't follow from Stalnaker's axioms.

2.   Show that this restricted version of the transitivity schema does follow from Stalnaker's axioms:
$(((\varphi > \psi) \wedge (\psi > \_|\_)) \to (\varphi > \_|\_))$.

3.   The law of Duns Scotus is the schema $(\sim \varphi > (\varphi > \psi))$. Are the instances of the schema derivable in Stalnaker's system? Explain your answer.

4.   Peirce's law is the schema $(((\varphi > \psi) > \varphi) > \varphi)$. Are the instances of the schema derivable in Stalnaker's system? Explain your answer.

5.   The law of exportation is the schema $(((\varphi \wedge \psi) > \theta) \to (\varphi > (\psi > \theta)))$. Are the instances of the schema derivable in Stalnaker's system? Explain your answer.

6.   The law of importation is the schema $((\varphi > (\psi > \theta)) \to ((\varphi \wedge \psi) > \theta))$. Are the instances of the schema derivable in Stalnaker's system? Explain your answer.

7.   Show, by giving a derivaion, that the Strong Centering schema, $(((\varphi > \psi) \wedge \varphi) \leftrightarrow (\varphi \wedge \psi))$ is a theorem schema of Stalnaker's system.

8.   Show, by giving a derivation, that the schema $(((\varphi \vee \psi) > \sim \varphi) \vee (((\varphi \vee \psi) > \theta) \supset (\varphi > \theta))$ is a theorem schema of Stalnaker's system.

9.   Show, by giving a derivation, that the Introduction of Disjunctive Antecedents schema, $(((\varphi > \theta) \wedge (\psi > \theta)) \supset ((\varphi \vee \psi) > \theta)))$, is a theorem schema of Stalnaker's system.