MATH 113: 4/25 WORKSHEET
MODAL LOGIC PRACTICE

Answer all questions and turn in next Monday as your homework for this week.

(1) Consider a frame that has at least two worlds, where there's a world w which doesn't access itself but does access another world. Come up with an assignment of truth values to the worlds of the frame so that $\Box P \to P$ is false at w.

(2) Explain why your counter-interpretation from the previous problem shows that the M axiom isn't a modal truth of K. That is, explain why $\vDash_K M$ is false.

(3) Come up with a counter-intepretation which shows that the 4 axiom isn't a modal truth of T. [Hint: consider a frame whose accessibility relation is reflexive but not transitive and come up with an assignment of truth values which makes $\Box P \to \Box\Box P$ false at a world.]

(4) Come up with a counter-interpretation which shows that the 5 axiom isn't a modal truth of $S4$. [Hint: consider a frame whose accessibility relation is reflexive and transitive but not symmetric.]