Name: $\qquad$ Grade: $\qquad$ <-- instructor use

1. Over a given alphabet $\Sigma$, how many regular languages are there? Why?
2. How do we know that every finite language is regular?
3. How many states in a FSM that represents the legal moves in the famous Towers of Hanoi problem? (64 disks)
4. If $\mathrm{L} \cap \mathrm{M}$ is regular, does that imply that L is regular?
5. If an n -state $\operatorname{DFSM} \mathrm{M}$ accepts a string of length n , what can we say about $\operatorname{IL}(\mathrm{M}) \mid$ ? Why?
6. The pumping theorem for regular languages:

If a language $L$ is regular, then $\exists \mathrm{k} \geq 1$ (
)
7. Rewrite the contrapositive form of pumping theorem
(informally, if some long enough string in L is not pumpable, then L is not regular): If $\forall \mathrm{k} \geq 1$ (

$$
\text { ) then } \mathrm{L} \text { is not regular. }
$$

8. Tell your instructor about anything from today's session (or from the course so far) that you found confusing or still have a question about. If none, please write "None".
