Assignment 5 hints, first portion

QUESTION 1: If you believe a claim is false, hunt for a counter-example. If you believe (perhaps after a long hunt for counter-examples) that a claim is true, then you need to use either mutual inclusion (to show that languages are equal) or standard equivalences (to show that regular expressions are equivalent).

QUESTION 2: Try to break up a typical string of L up into components that are described by a regular expression. If there are several cases, use the $+$ operator.

QUESTION 3: Proving a DFSA correct usually requires a state invariant (see Course Notes). Proving a regular expression correct requires that the language it denotes is equal to the language specified.

QUESTION 4: Keep the number of states in the two original machines as small as possible, so that the subset construction will stay pretty small.

QUESTION 5: If you can think of a regular expression that denotes L, or an FSA that accepts L, then L is regular. Regular languages are closed under complement, intersection, union, Kleene star, and some other operations. If you believe that L is not regular, then occasionally the Pumping Lemma will help you prove that L must contain strings that contradict L's definition.