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a. Let $M = (Q, \Sigma, \delta, q_1, F)$ and compliment is $\overline{M} = (Q, \Sigma, \delta, q_1, Q - F)$ works for complement lang

M and $\overline{M}$ have the same transition function, and therefore is a DFA as well, meaning that the same string w will always end in the same state. M and $\overline{M}$ will end in the same state with input w since they share the same input w.

If we assume $w \in B$, Then M accepts it, therefore the finished state $f \in F$ is an accept state of M. Since $\overline{M}$ has the opposite accept states, $\overline{M}$ does not accept w.

if we assume $w \notin B$, then M does not accept w. therefore $f \notin F$, since the final states of $\overline{M}$ are $Q - F$, thus $f \in Q - F$, $\overline{M}$ accepts w.
Therefore $\overline{M}$ accepts $\overline{B}$