

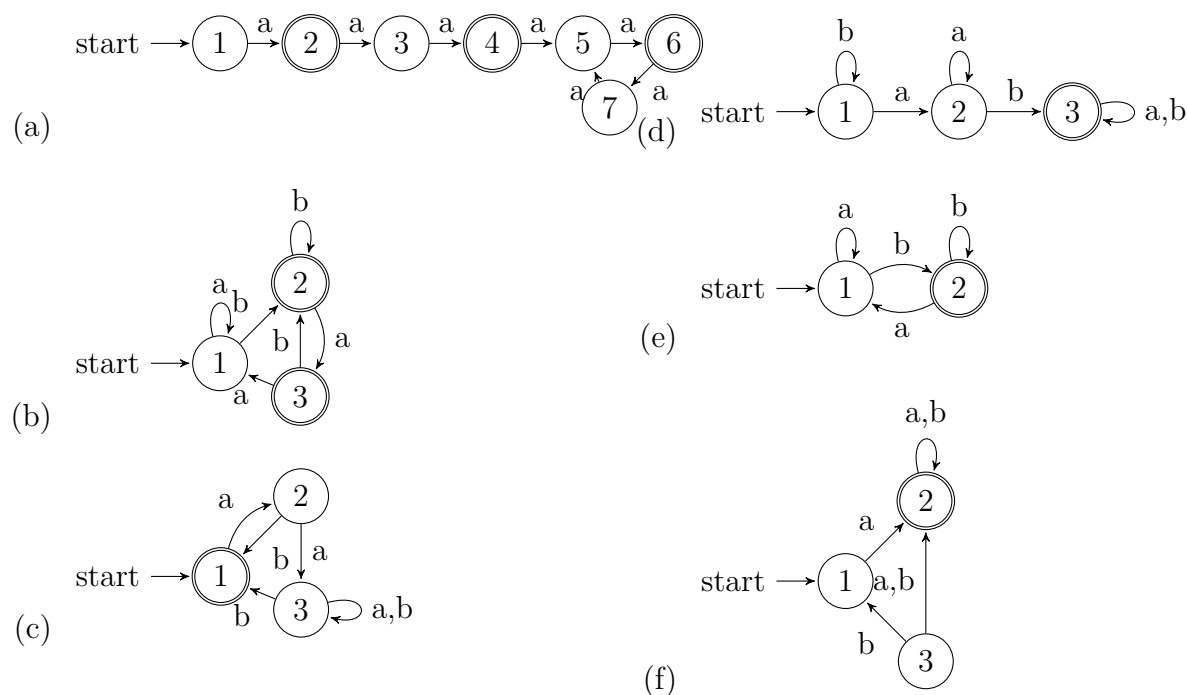
Problem 1 (Testing equivalence of regular expressions).

(a) Describe an algorithm to test equivalence of two regular expressions.

(b) Apply it to the following pair of regular expressions:

$$(a + b)(a + b)^* \quad \text{and} \quad a(a + b)^* + b(a + b)^*$$

Problem 2 (Automaton to regex). Construct regular expressions for languages accepted by the following automata.



Problem 3 (Are regular expressions regular?). Fix a finite alphabet Σ . Is the language consisting of all regular expressions over Σ a regular language?