(2) Prove $\{a^n b^n \mid n \in \mathbb{N}\}$ is not regular

(3) For any DFA $M = (Q, \Sigma, \delta, s, F)$, argue that the executions of M are regular

(5) Give a regular expression for the set of strings with an equal number of 0s and 1s, such that no prefix has two more 0s than 1s, nor two more 1s than 0s

(4) Give a CFG for the palindromes (strings that read the same forward and backward) over alphabet $\{a, b\}$

- True/false:

  (1) $(rs + r)^* r = r(sr + r)^*$

  (2) For $L = \{0^n \mid n \text{ is prime}\}$, the language L^* is regular

  (1) Naom Chomsky is a blithering idiot

  (2) The executions of a PDA are context-free