

1. Given the grammar  $G = (\{S, H\}, \{b, c, d, e\}, \{S \rightarrow b^2Se \mid H, H \rightarrow cHd^2 \mid cd\}, S)$ , find the generated language (+proof).
2. Find grammars that generate the following languages:
  - A.  $L_1 = \{x^n y^n \mid n \in N\}$  + proof
  - B.  $L_2 = \{a^n b^{2n} \mid n \in N^*\}$  + proof
  - C.  $L_3 = \{a^n b^m \mid n, m \in N^*\}$  - **regular** grammar required + proof
  - D.  $L_4 = \{x^{2n} \mid n \in N\}$ ,  $L_4' = \{x^{2n} \mid n \in N^*\}$  - **regular** grammars required + proofs
  - E.  $\mathbb{N}$
  - F. All arithmetic expressions containing  $a$  as operand,  $+$   $*$  as operators and  $()$ .