Problem (Problem 1)**:** Let F be a finite field with q elements.

(a) Find the order of the general linear group

$$GL_n(F) = \{A \in Mat_n(F) \mid \det(A) \neq 0\}.$$

(b) Find the order of the special linear group

$$SL_n(F) = \{A \in Mat_n(F) \mid \det(A) = 1\}.$$