

KING SAUD UNIVERSITY

QUIZ 1

COLLEGE OF SCIENCE

NAME:

MATH343-14471

DEPARTMENT OF MATHEMATICS

STUDENT ID:

- (a) Prove or disprove: $H = \{\frac{a}{2^n} : a, n \in \mathbb{Z}, n \geq 0\}$ forms a group under the usual addition.
- (b) Let S be the set of all symmetric matrices in $M_n(\mathbb{R})$, that is $S = \{A \in M_n(\mathbb{R}) : A^T = A\}$. Show that S is a subgroup of $M_n(\mathbb{R})$ under matrix addition. Is $S \cap GL(n, \mathbb{R})$ a subgroup of $GL(n, \mathbb{R})$ under matrix multiplication?
- (c) Find $U(18)$. Find the orders of all its elements.