Exercise 1:

Let $\mathbb{Z}^2 = \mathbb{Z} \times \mathbb{Z}$ be a group where

$$\mathbb{Z}^2 = \{(m, n) | m, n \in \mathbb{Z}\}$$

Let $H = \{(x, y) | x + y \geq 0\}$. Is H subgroup of $\mathbb{Z}^2$?

Exercise 2:

- Prove that $a\mathbb{Z}$ is a subgroup of $\mathbb{Z}$.
- Let a and b be integers. Prove that the subset $a\mathbb{Z} + b\mathbb{Z} = \{ak + bl | l, k \in \mathbb{Z}\}$ is a subgroup of $\mathbb{Z}$