1. Short answer questions

1. (Def: set, element, equality of sets, empty set, cardinality of set)
Let $S = \{\emptyset, \{\emptyset\}, 5\}$.

(a) List all its elements.

(b) List all its subsets.

2. (Def: set builder notation)

Write out the elements of the following sets:

(a) $\{x \in \mathbb{N} : x^2 < 5\}$

(b) $\{x^2 : x \in \mathbb{Z}, |z| < 3\}$

3. (Def: ordered pair, ordered $n$-tuple, Cartesian products and powers)

(a) Write out the elements of the Cartesian product $\{1, 2\} \times \{1, 3\}$.

(b) Give an example of a subset of $\mathbb{R}^2$ that is not itself a Cartesian product.