

Quiz 1
MA3.101: Linear Algebra (Spring 2019)
Time : 20 Mins
Total Marks: 15

January 22, 2019

Questions

1. Consider the set of positive real numbers \mathbb{R}_+ . Define an operation \oplus between two positive real numbers x, y as

$$x \oplus y \triangleq xy$$

where xy is the product of x and y as per usual multiplication. Define another operation between any real number (not necessarily positive) c and another positive real number x as $c \cdot x \triangleq x^c$. Show that with these operations, \mathbb{R}_+ forms a vector space over \mathbb{R} . Describe a nontrivial subspace of this space.

2. Show that the space of continuous functions from \mathbb{R} to \mathbb{R} is a vector space over \mathbb{R} .
3. The set of invertible $n \times n$ matrices is a subset of $\mathbb{R}^{n \times n}$. Is it also a subspace? Support your answer with proper reasoning.