

## Quiz 10

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

**Question 1.** (5 marks) Find the distance between the two lines:  $\vec{x} = (0, 0, 1) + t(1, 0, 0)$  and  $\vec{x} = (0, 0, 3) + t(0, 1, 0)$ .

**Question 2.** §4.1 #2e (5 marks) Let  $V$  be the set of all ordered pairs of real numbers, and consider the following addition and scalar multiplication operations on  $\vec{u} = (u_1, u_2)$  and  $\vec{v} = (v_1, v_2)$ :

$$\vec{u} + \vec{v} = (u_1 + v_1 + 1, u_2 + v_2 + 1) \text{ and } k\vec{u} = (ku_1, ku_2)$$

Find two vector space axioms that fail to hold.