

Math 317 Section B1 Quiz 7 (with solution)

April 5, 2002

**Problem 1.**

Consider the ring of complex numbers  $\mathbb{C}$ . Let

$$S = \{a + bi \mid a, b \in \mathbb{R} \text{ and } a^2 + b^2 = 1\}$$

Is  $S$  a subring of  $\mathbb{C}$ ? Explain why.

**Solution.**

The set  $S$  is not a subring of  $\mathbb{C}$ , since  $S$  is not closed under subtraction. For example, for  $z_1 = z_2 = 1$  we have  $z_1 \in S, z_2 \in S$  but  $z_1 - z_2 = 0 \notin S$ .