

Math 3140 — Fall 2012

Quiz #1

Name:

Problem 1. Define a relation $x \sim y$ if $x - y \geq 0$. Is \sim an equivalence relation? Explain your answer.

Solution. This was meant to be a relation on the set \mathbf{R} of real numbers. It is not an equivalence relation because it is not symmetric: if \sim were symmetric then whenever $x \sim y$ we would also have $y \sim x$. But this would mean that whenever $x \leq y$ we also have $y \leq x$, which in reality only happens for $x = y$. \square

Problem 2. Write down a basis for the real vector space \mathbf{C} .

Solution. \mathbf{C} is the set of complex numbers. It is a 2-dimensional real vector space and has a basis $\{1, i\}$. \square