

Math 2001: Homework P4

Due: September 25, 2013

1. Identify whether each of the following statements is true or false. If it is true, prove it. If it is false, then provide a counterexample.

(a) Let A , B , and C be sets. Then

$$(A \cap B) \cup C = A \cap (B \cup C).$$

(b) If $a, b \in \mathbb{Z}_{\geq 1}$ and both \sqrt{a} and \sqrt{b} are irrational, then \sqrt{ab} is irrational.

2. From the book do problems:

(a) 2.1.6, 2.1.11, 2.1.28

(b) 2.2 (a–e)

3. Prove that $\sqrt{6}$ is irrational.