

Mathematics 216
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Homework 27
Due April 13, 2012

1. Define a relation \sim on \mathbf{R}^2 by setting $(a, b) \sim (c, d)$ if there is a non-zero real number λ so that $(a, b) = (\lambda c, \lambda d)$. Prove that \sim is an equivalence relation. Be sure to explain in your proof where it was important that $\lambda \neq 0$.
2. Suppose that a , b , and c are positive integers, and $(a, b) = 2$ and $(a, c) = 3$. Say as much as possible about (a, bc) .
3. Suppose that a , b , and c are positive integers, and $(a, b) = 2$ and $(a, c) = 4$. Say as much as possible about (a, bc) .
4. Suppose that a , b , and c are positive integers, and $(a, b) = 2$ and $(a, c) = 4$. Say as much as possible about (a^2, bc) .