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Homework 22
Mathematics 2216.01
Due November 14, 2022

1. Solve each of these congruences for x by computing 5^{-1} using the Euclidean algorithm:
 (a) $5x \equiv 11 \pmod{101}$
 (b) $5x \equiv 11 \pmod{103}$
 (c) $5x \equiv 12 \pmod{103}$.
In each case, find the smallest positive integer x satisfying the congruence.

2. Define a relation $\sim$ on $\mathbf{R} \times \mathbf{R}$ by setting $(a, b) \sim (c, d)$ if there is a nonzero real number λ such that $(a, b) = (\lambda c, \lambda d)$. Prove that $\sim$ is an equivalence relation.