
Section 6 Suggested Problems For Exam 1

Most exercises can be found in Section 6 of the textbook (*Elementary Number Theory* by U. Dudley, 2nd Edition).

- Section 6 # 4, 11, 12
- Let p and q be distinct primes such that $a^p \equiv a \pmod{q}$ and $a^q \equiv a \pmod{p}$. Prove that $a^{pq} \equiv a \pmod{pq}$.
- A *Carmichael number* is a composite integer n such that $a^n \equiv a \pmod{n}$ for every integer a . The smallest Carmichael number is 561. Use Fermat's Theorem and the Chinese Remainder Theorem to show that 1105 is a Carmichael number.