

Mathematical Thinking

Week 4 Activity Questions

October 10, 2023

Contents

1 Fermat's Little Theorem

1. Fermat's little theorem for the prime $p = 13$ says that a^{12} leaves remainder 1 when divided by 13 for any number a that is not divisible by 13. Write down a table of remainders obtained when a^n is divided by 13 for $a = 1, 2, \dots, 12$ and $n = 1, 2, \dots, 12$. Can you find other pairs (a, n) for which a^n leaves a remainder 1?

2 Fundamental Theorem of Arithmetic

3 Modular Arithmetic

4 Arithmetic with Congruences

1. If $10 + 15$ is congruent to $4 \pmod{b}$, what do you think are the possibilities for b ?