Properties of Powers of 3

Key Concepts:

- Powers of 3
- Modular arithmetic
- Decimal representation
- Odd digits
- Divisibility rules

Important Definitions:

- Modular arithmetic: A system of arithmetic for integers, where numbers 'wrap around' upon reaching a certain value (modulus).
- Decimal representation: The way a number is represented in base 10.

Examples:

- The powers of 3 modulo 20: 3^1 = 3, 3^2 = 9, 3^3 = 7, 3^4 = 1
- The decimal representation of 3^4: 81

Introduction to Modular Arithmetic

- Understanding the concept of modular arithmetic
- Applying modular arithmetic to powers of 3

Analyzing Decimal Representation

- Understanding how numbers are represented in decimal
- Relating decimal representation to modular arithmetic

Summary:

This problem involves showing that powers of 3 (with n >= 3) cannot have only odd digits in their decimal representation, using modular arithmetic and properties of

powers of 3.