# Fibonacci numbers. Other Homework problems

Tanya Khovanova

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Teacher: What are whole numbers?
Student: Like 0, 6, 8, 9.
Teacher: And what about 10?
Student: It is half-whole, 1 doesn't have a hole.

Finish the problems from the class handout.

## Competition practice

**Exercise 1. 2002 AMC 10A. Problem 15.** The digits 1, 2, 3, 4, 5, 6, 7, and 9 are used to form four two-digit prime numbers, with each digit used exactly once. What is the sum of these four primes?

**Exercise 2. 2002 AMC 10B. Problem 6.** For how many positive integers $n$ is $n^2 - 3n + 2$ a prime number?

**Exercise 3. 2002 AMC 10B. Problem 7.** Let $n$ be a positive integer such that $1/2 + 1/3 + 1/7 + 1/n$ is an integer. What is $n$?

**Exercise 4. 1983 AIME.** Let $a_n$ equal $6^n + 8^n$. Determine the remainder upon dividing $a_{83}$ by 49.

## Challenge Problems

**Exercise 5.** Prove that the number written as $3^n$ ones is divisible by $3^n$.

**Exercise 6.** Invent a way to continue the Pascal's triangle up.