

**2014 MATH FIELD DAY
HUDDLE PROBLEMS**

Problem 1. Find the largest natural number n such that

$$n^{2014} < 2014^{1007}.$$

Problem 2. Evaluate

$$\sqrt{10^{\log_5(10)}} - 10^{\log_5 \sqrt{10}}.$$

Problem 3. Find the remainder when the sum

$$1! + 2! + 3! + \cdots + 100!$$

is divided by 15. (Recall that $n! = 1 \times 2 \times 3 \times \cdots \times n$.)

Problem 4. A circle is suspended between the tips of two equilateral triangles of side length $\sqrt{3}$, so that the circle is tangent to the edges of the triangles at the vertices. Find the area of the circle.

