
Problem of the Week

Number Four

February 15, 2016

Have you ever noticed that to mathematicians, “solutions” mean finding the answers, but to chemists, “solutions” are things that are still all mixed up?

That’s right! It’s time for some of those jokes regarding the antics of mathematicians as they interact with folks in other disciplines.

A mathematician and an engineer are on a desert island. They find two palm trees with one coconut each. The engineer climbs up one tree, gets the coconut, and eats. The mathematician climbs up the other tree, gets the coconut, climbs the other tree and puts it there. He says, “Now we’ve reduced it to a problem we know how to solve.”

An engineer, a physicist, and a mathematician were asked to hammer a nail into a wall. The engineer built a Universal Automatic Nailer—a device able to hammer every possible nail into every possible wall. The physicist conducted a series of experiments on the strength of hammers, nails, and walls. He then developed a revolutionary technology of ultra-sonic nail hammering at super-low temperature. The mathematician generalized the problem to N dimensions, framing it as a problem of penetrating a one-dimensional nail into an $N - 1$ dimensional hyper-wall. He proves several fundamental theorems. Of course, the problem is too rich to suggest the possibility of a simple

solution. Even the existence of a solution is far from obvious.

A college Dean says to the physics department, “Why do I always have to give you guys so much money, for laboratories and expensive equipment and stuff. Why couldn’t you be like the math department—all they need is money for pencils, paper, and waste-paper baskets. Or even better, be like the philosophy department. All they need are pencils and paper.”

Here’s this week’s problem:

Find the smallest, positive, integral value of n for which the fraction

$$\frac{n - 12}{5n + 23}$$

is both non-zero and reducible.

When you think you have the problem figured out, follow the instructions below.

*Submissions are due to Jason Rosenhouse by 5:00 on **Friday, February 19**. Solutions should be written on the back of an official POTW handout. Place your name, e-mail address, and the section numbers and professors of any math courses you are taking, in the **upper right corner** of the front of the page. One weekly winner will receive a five-dollar gift card from Starbucks. Solutions will be posted at this website, by the Monday after the problem is due:*

<http://educ.jmu.edu/~rosenhjd/POTW/Spring15.html>