Problem of the Week
Number One
January 25, 2016

What's polite and works for the phone company?

A deferential operator!

What's non-orientable and lives in the ocean?

Möbius Dick!

Here at Problem of the Week we're always trying to outdo ourselves. No resting on our laurels at this operation, no sir! Sometimes, though, we even amaze ourselves. Folks, we have a real humdinger of a semester ahead of us, because our theme for the term is:

> **NUMBER THEORY WITH MATH JOKES**

That's right, math jokes! You know, like the one about the student who, when asked to expand $(a + b)^3$ wrote

$$(\quad a \quad + \quad b \quad)^3$$

Or the one about how mathematicians never go to the beach, because who needs the sun when you can get a tan just with sine and cosine?

Aren't you glad you showed up this term?

As always, we start with a fairly easy problem. Since it's about cubes, I guess we need a cube-themed joke. How about this: A man challenges a mathematician to divide fourteen sugar cubes into three cups of coffee so that each cup gets an odd number of cubes. The mathematician thinks for a moment and then says, "One, one, and twelve." The man scoffs and says, "But twelve isn't odd!" The mathematician replies, "I'd say it's pretty odd to put twelve cubes of sugar into a cup of coffee, wouldn't you?"

Well, since you asked, here's one more: Why won't Goldilocks drink from a glass with exactly eight pieces of ice in it? Because it's too cubed!

Maybe we should just get on with the problem:

Find four consecutive positive integers such that the sum of the cubes of three of them is equal to the cube of the fourth.

If you really want to go for glory you can try to prove there is only one possible answer to this week's problem, but that is not required of you. When you think you have the problem figured out, follow these instructions:

*Submissions are due to Jason Rosenhouse by 5:00 on **Friday, January 29**. 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