Problem of the Week
Number Two
January 30, 2017

Here is an amusing fact I learned recently: the words "parabola" and "parable" actually have the same origin. Since a parabola is a particular sort of conic section, while a parable is a story told to make a point, they would not seem to have anything much in common.

But they do! They both descend from the Greek words *para*, which means alongside, nearby, or right up against; and *ballein*, which means to cast or throw. Thus, the word *parabellein* means to cast alongisde, or to throw up against.

Now, in the theory of conic sections, ellipses have an eccentricity smaller than one, while hyperbolas have an eccentricity greater then one. Between them are the parabolas, which have an eccentricity of exactly one. The parabolas are thrown right up against the ellipses on one side and the hyperbolas on the other.

Putting one thing alongside another is also what you do when you are comparing two things, and "to compare" became a second meaning of the word "parabellein." A parable is a story that compares a complex situation to a simpler one.

And since parables were originally presented orally, a whole collection of words related to speaking or discussing descend ultimately from the same origin. I am referring to words like parlor, parley, and parliament.

I got all this from Steven Schwartzman's book *The Words of Mathematics: An Etymological Dictionary of Mathematical Terms Used in English.* Word origins can be fun!

So can algebra. Have a go at this week's problem.

If
$$\frac{1}{x^3} - \frac{1}{x^2} - \frac{1}{x} - 1 = 0,$$
then what is the value of
$$x^3 + x^2 + x + 2?$$

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