PROBLEM OF THE WEEK #9
(Spring 2024)

Let $p(x)$ be a polynomial with integer coefficients. Suppose that the equation $p(x) = 1$ has exactly r integer solutions, and the equation $p(x) = 0$ has exactly s integer solutions, with $r > 0$ and $s > 0$. Show that the pair (r, s) is either $(1, 1)$, $(1, 2)$, or $(2, 1)$.

Solution:

We are withholding our solution for now, because this is an active puzzle problem from "The Playground" in *Math Horizons*, a journal of the Mathematical Association of America. If you solved this problem, you should submit your solution to the journal; you might see your name in print!

They write, "[S]olutions should be submitted to. . . *MHsolutions@maa.org* . . . (PDF format preferred). . . . Please include your name, email address, and [school] affiliation, and indicate if you are a student." You should probably also mention the name and number of the problem, which are in the citation below. Their deadline is May 31, 2024. We'll publish our solution sometime after that.

Source: Anthony Bevelacqua, "A Few Good Integer Polynomials (P465)," *Math Horizons* **31**:3 (February 2024), 31, 33.