
Problem of the Week

Number Two

September 8, 2014

When I was growing up, my brother and I used to play a game called Krypto. Five cards were dealt onto the table, face up, each showing a number between 1 and 25. A sixth card was then dealt face-up, beside the first five. The goal was to use the standard arithmetic operations to manipulate the five given cards into the sixth. Standard mathematical notation (such as factorials, exponents, square roots, parentheses, and decimal points) was permitted, but concatenation was not allowed. For example, if the five given numbers were 1, 2, 3, 4, 5 and the goal was to make 6, then here are two possibilities:

$$6 = 3(5 - 4) + 2 + 1$$

$$6 = (5 + 1)(2 + 3 - 4)$$

For your problem this week I've come up with five Krypto hands for you to ponder.

Solve each of the following Krypto hands:

1. **Given:** 1, 2, 5, 6, 17. **Goal:** 8.
2. **Given:** 1, 4, 9, 15, 20. **Goal:** 10.
3. **Given:** 2, 3, 5, 6, 21. **Goal:** 12.
4. **Given:** 5, 7, 11, 19, 23. **Goal:** 1.
5. **Given:** 18, 20, 21, 22, 25. **Goal:** 3.

Please note that you are required to use all five numbers in your solution.

Of course, there are multiple solutions for each hand. You only need to provide one for each.

Come to think of it, Krypto is also the name of Superman's dog. So how about a little puzzle about dogs: Two dogs were standing in a field facing in opposite directions. One was facing due north while the other was facing due south. It turns out, though, that the dogs were able to see each other without employing any mirrors or reflecting surfaces. How is this possible?

When you've worked out the bit about the Krypto hands, please have a look at the directions on the other side of this page \implies

*Solutions are due to Jason Rosenhouse by 5:00 on Friday, September 12. **Solutions should be written on an official POTW handout, in the space below.** 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. Please make sure that the answer to the problem is displayed clearly and prominently, in a box when appropriate. Problems are available at the bulletin board outside Roop 119, and also at the website:*

<http://educ.jmu.edu/~rosenhjd/POTW/Fall14/homepage.html>