

## Corrections to *Mathematical Mind-Benders*

(contributed by eagle-eyed readers—the kind I love)

Page 5. Tamas Lengyel is at Occidental College in Los Angeles, not at Macalester College.

Page 16. At the end of the third paragraph from the bottom, the second Sicherman die should be  $\{1, 2, 2, 3, 3, 4\}$ , not  $\{2, 3, 3, 4, 4, 5\}$ .

Page 17. The factor  $(x^2 + x - 1)^2$  in the expression for  $h(x)$ , in the middle of the page, should have been  $(x^2 - x + 1)^2$ .

Page 22. Concerning the solution to *A Truly Even Split*: There is a vast literature on multi-grade equations. The biggest contributor is Albert Gloden, whose latest book is *Mehrgradige Gleichungen*, 2d edition, mit einem Vorwort von Maurice Kraitchik, P. Noordhoff, Groningen, 1944.

Page 23. The puzzle *Subsets with Constraints* was meant to be applied to numbers from 1 to 30, not 1 to  $n$ . The solution beginning on page 29 assumes numbers from 1 to 30, but the techniques do work for arbitrary  $n$ .

Page 27. At the beginning of the solution to *Getting the Numbers Back*, “The answer if that” should be “The answer is that.”

page 29. “Binet’s” formula was known to Euler, and is due to de Moivre (1667-1754)—and may go even farther back than that.

Page 32, lines 2 and 3 should have been: “But  $f$  also satisfies  $f(x) = x - x^2 + f(x^4)$ , which, since  $x^4 < x$ , implies that for any  $c$ , the sequence  $f(c), f(c^{1/4}), f(c^{1/16}), \dots$  is strictly increasing.” The Elkies source cited on page 31 has it right.

Page 32, 4 lines up, the displayed formula should be:

$$m + n = \left( \frac{1}{p} + \frac{1}{q} \right) t + \frac{1}{p} \delta + \frac{1}{q} \varepsilon .$$

Page 33, 7 lines up: Should be  $\alpha_n \geq \beta_n$ , not  $\alpha_n \leq \beta_n$ .

Page 34, Figure 4: The third arrow from the left should point to the fifth, not the fourth, die on the bottom; and therefore should be labeled with 0 ( $= 12 - 12$ ), not 3.

Page 75, *Recovering the Polynomial*: Helge Tverberg (University of Bergen, in Norway) points out that this problem makes sense even if it is only known that the coefficients are non-negative reals. To recover the polynomial  $p$ , you first ask for  $p(1)$ ; if it’s 0 then  $p \equiv 0$  and you are done. Otherwise, you can use further queries to form “difference triangles.” Recursively define  $p_0(x) = p(x)$ ,  $p_{i+1}(x) = p_i(x+1) - p_i(x)$ . At step  $k$ , ask for  $p(k)$  and use the values

$p(1), \dots, p(k)$  to compute  $p_{k-1}(1)$ . This will hit 0 exactly when  $k$  reaches  $d+2$  where  $d$  is the degree of  $p$ . Once you know  $d$ , any  $d+1$  of the  $d+2$  values you already have suffice to determine  $p$ .

Page 76, *Urn Solitaire*: Tverberg notes also that there is a “less tricky,” but still quite elegant, proof for this problem using induction on the total number of balls.

Page 78, *Poker Quickie* solution: The hand AAA55 does not quite deserve to be among the best, because at least one of the 5’s must be in the same suit as an Ace, and those two cards couple-cover the straight flush A2345 in that suit. Thus AAA55 prevents at most 15 straight flushes—*two*, not one, for each ace, and five for each 5, minus 1 for the overcount. The best hands, AAA66 through AAA99, prevent 16 each. The last line (which contains an arithmetic error as well) should have said that AAAKK permits  $40 - 9 = 31$  straight flushes instead of  $40 - 16 = 24$ .

Page 79, middle: “Tristan can counter this with an O in 13 or 14 (or an S in 12 or 13)” should have been “Tristan can counter this with an O in 13 or 14 (or an S in 12)”. If he plays an S in 13, Isolde wins immediately with an O in 12.

Page 87. The last sentence is nonsense; delete it.

Page 111. The sentence above the figure should have begun “You might in fact have to cut quite a few wedges. . .”.

Page 113. The problem “Charlie and the Cheaters” failed to make it clear that Charlie knows the values of  $i$  and  $j$  as well as  $k$ . (Thanks to David Feldman of UNH for pointing this out.)

Page 117, Figure 42: angle label “ $x4z$ ” should be “ $x - 4z$ .”

Page 118, 11 lines up, should have been: “The key is to note that event (c) is an independent copy of event (b) if you reverse both space and time,” not “of event (a).”

Page 135, 7 lines up, “i.e.” should be “e.g.”

Page 136. The last line of *Twisting the Rectangle* should begin  $\sqrt{3} \approx 1.73$ , not  $\sqrt{3} \approx 1.83$ .