(Continued from page 372)

3. The ninth prime is 23. What year will it be 999 years from now? Reverse the digits of 1992 to find out.

4. The largest prime factor of 9 is 3. Divide the sum 1992 and its reversal by 3, and then turn it "upside down." Hmmm. Back to the beautiful 1991.

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Minimal president

"Mathematical Modeling and the Presidential Election" (October 1992, 520–21) reminded me of George Pólya's March 1961 article, "The Minimum Fraction of the Popular Vote That Can Elect the President of the United States." Pólya's article was mentioned by Andrew Sterrett in his short note on page 635 of the November 1980 issue. Sterrett suggested that in a three-candidate race, a president might receive a fraction of the popular vote approximately equal to 0.058, or less than 6 percent of the popular vote.

On the basis of my own results regarding the 1960 election, I found that a person could have been elected president with a minimum of only 12.49 percent of the popular vote cast. Even with 100 percent of the eligible voters voting in 1960, a very unlikely scenario, a candidate needed to receive only 21 percent of the popular vote. The conclusions are based on data from *Current Population Reports* from the U.S. Bureau of the Census, series P-23, no. 14.

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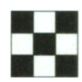
Witkowski responds: I would like to thank Don Warkentin for bringing to my attention an article, "The Minimum Fraction of the Popular Vote That Can Elect the President of the United States," by George Pólya. This article, published in March 1961, was apparently the original source of a problem that I had been using in my classes for about twelve years. I want to apologize to readers of the *Mathematics Teacher* for any confusion regarding the authorship of the problem. I inadvertently omitted a statement asserting that the problem was passed on to me and that I did not know the original source.

Orient express checkerboard

In his article "David Copperfield's Orient Express Card Trick" (October 1992, 568–70), Sidney Kolpas's proof of how the trick works uses a matrix and a parity argument. This argument can be made visually, and perhaps be more clear to students, using a checkerboard-colored matrix. The grid that follows is given at the start of the trick.



At the start of the trick, you are on a white square. A move was defined as up, down, right, or left. Thus after each move, you change colors. The trick went as shown in **figure 1**.

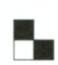
Step	Number of Moves	Final Position	Change in Grid	Shape of Grid
Step 1	4 moves	on white square	black square removed	
Step 2	5 moves	on black square	white square removed	
Step 3	2 moves	on black square	white square removed	
Step 4	3 moves	on white square	2 black squares removed	
Step 5	3 moves	on black square	white square removed	
Step 6	1 move	on white square	2 black squares removed	

Fig. 1

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Kolpas responds: Hirschhorn's decidedly right-brained, visual proof is very elegant. For many students, his visual orientation would be much easier to understand. For many other students, it would be highly beneficial to present both of our proofs, thus attaining bilateral understanding.

Our different proofs highlight an important consideration for effective teaching. We must, where possible, teach concepts both visually and symbolically to reach all learners optimally.

Finally, our different proofs demonstrate one of the most appealing aspects of mathematics—that it is a highly creative endeavor. As I continually tell my students, myriad ways exist to prove theorems and solve problems.

Lack of symmetry

The December 1992 *Mathematics Teacher* article, "A Generalized Area Formula," by Usnick, Lamphere, and Bright (pp. 752–54), contains a statement on page 753 that **figure 3** has "diagrams used for development of formula for area of a trapezoid." However, **figure 3c** can only be used for an isosceles trapezoid as shown. It is not applicable for the general or scalene trapezoid, since the shaded triangle on the left cannot be flipped over and shifted to the right side because of lack of symmetry. The authors could have shown that any scalene trapezoid can first be transformed to half a parallelogram as in **figure 3b,** and then that a parallelogram can be transformed into a rectangle as in **figure 2.** That resulting rectangle will then be twice the area of the original trapezoid,

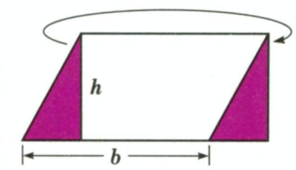
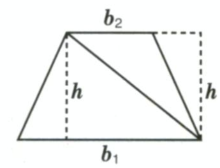
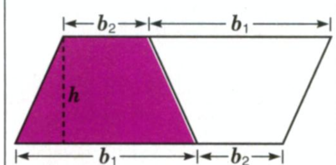


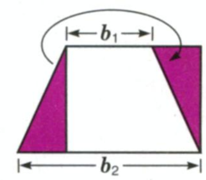
Fig. 2



(a) Trapezoid as two triangles



(b) Trapezoid as half a parallelogram



(c) Trapezoid transformed to a rectangle

Fig. 3

and the formula

$$A = \frac{1}{2}(b_1 + b_2)h$$

will apply.

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Inappropriate?

In the October 1992 issue, Martin Bonsangue asks: "Is It True That 'Blonds Have More Fun'?" (pp. 579–81). I think it is inappropriate to use this example in a classroom. I am a member of the faculty at the College of Staten Island, where we have a diverse population including students who are African-American, Hispanic, Puerto Rican, Asian, Pacific Islander, and Native American as well as Caucasian. Students in these ethnic and racial groups are in my classes. It is irrelevant to someone who

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