

PROBLEM-SOLVING STRATEGIES FOR EFFICIENT AND *Elegant* SOLUTIONS

A Resource for the Mathematics Teacher



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Foreword by Nobel Laureate Herbert A. Hauptman

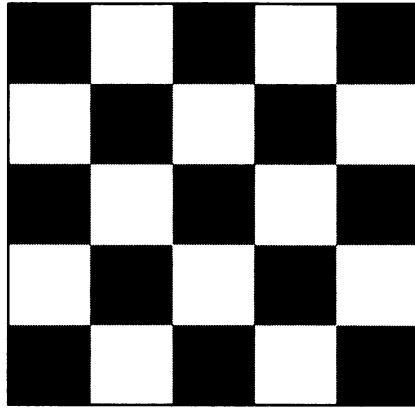


Figure 7.17

Now, to change seats as Mr. Strauss instructed, each student must move from a black square (or “seat”) into a white square. Because there are 13 black squares and only 12 white squares, the students cannot follow Mr. Strauss’s directions.

Problem 7.11

A jeweler makes silver earrings from silver blanks. Each blank makes 1 earring. The shavings left over from 6 blanks are then melted down and recast to form another blank. The jeweler orders 36 blanks to fill an order. How many earrings can be made from the 36 blanks?

Solution. Students usually assume that 36 blanks will yield 36 earrings. They are quite surprised when they find that this is not the correct answer. Some astute students may recognize that the leftover silver can form 6 additional blanks, thus yielding 42 earrings. This, too, is incorrect.

Let’s use the **visual representation (make a drawing)** strategy to see what happens as the jeweler works. From the original 36 blanks, we do obtain 36 earrings. However, notice that the shavings left over from these 36 blanks are melted down and form 6 new blanks, yielding 6 additional earrings. However, we don’t stop here—the shavings from these 6 blanks are then melted down and recast to form 1 new blank from which we obtain 1 additional earring. Thus, Figure 7.18, 43 earrings are possible.