Puzzle Corner

By Allan J. Gottlieb, '67

Several readers have sent problems and solutions to me; they will all appear in next month's issue. Due to a variety of personal crises and a plea from my editor to "keep it short this month," I shall dispense with the usual small talk and get right down to business.

Problems

8—Prove that for any even integer m greater than 2, there is an infinity of odd integers not the sum of a prime and a positive power (>1) of m.

9—Show that there are irrational numbers s and t such that s^t is rational.

10—Assuming

$$f(n) = \sqrt{n + \sqrt{n + \sqrt{n + \ldots}}}$$

converges for all integers n, show that given any integer y there is an integer n such that f(n) converges to y.

11—For which positive values of a and c is $a^n \cdot n! > c \cdot n^n$ true for every positive integer n?

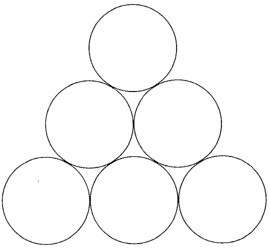
12—What is the largest number of queens which can be placed on a chess board such that no three queens lie in a straight line? Any solution greater than 14 will be printed.

The Speed Department

13—Assuming that B•S is non nonzero, show that the following relation is impossible.

$$\begin{array}{r} \text{SEX} \\ +\ \text{I S} \\ \hline \text{BEST} \end{array}$$

14—Consider six dimes forming a pyramid as below:



Change the figure into a circle by making four moves, each of which consists of sliding a dime to a new position where it is tangent to exactly two others.

Solutions

Please send your solutions to me addressed to Baker 438, 362 Memorial Drive, Cambridge, Mass. 02139.