

Two from Martin Gardner

Martin Gardner is a very famous problem proposer. He wrote the Mathematical Games column in *Scientific American* for twenty-five years. Here are two problems from his book *My Best Mathematical and Logic Puzzles*.

1. Write down any three-digit number, and then repeat the digits in the same order to make a six-digit number (e.g., 394,394). Divide this six-digit number by 7 (there won't be a remainder), divide the result by 11 (again, there won't be a remainder), and divide this last result by 13 (there still won't be a remainder!). Show that the number you now have is equal to the three-digit number that you started with!

2. Only two digits in the following long division problem are revealed. Find the other digits.

$$\begin{array}{r} \underline{XX8XX} \\ XXX)XXXXXXXX \\ \underline{XXX} \\ XXXX \\ \underline{XXX} \\ XXXXX \\ \underline{XXXXX} \\ 0 \end{array}$$