A Page of Problems

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HIGH SCHOOL

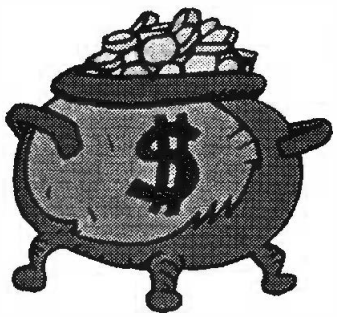
Find the smallest number that, when divided by each of the values 2, 3, 4, 5, 6, 7, 8, 9 and 10, will give, in each case, a remainder that is one less than the divisor.

Hint: restate the problem in your own words.

Source: Kantecki, C, and L. E. Yunker. "Problem Solving for the High School Mathematics Student." *Math Monograph* 7 (1982): 49–60.

JUNIOR HIGH

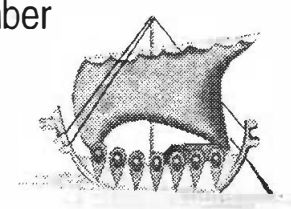
What is the least number of coins (the largest of which is a quarter) necessary to make any amount from 1¢ to 99¢?



Source: *Mathematics Teacher* 82, no. 8 (1989): 626.

ELEMENTARY

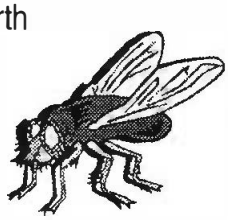
Three cannibals and three missionaries are on the same side of the river. They have one boat that can hold only two people. How can they all cross the river safely knowing that any time the cannibals outnumber the missionaries, the missionaries will be eaten?



Source: Adapted from http://partner.galileo.org/schools/strathmore/math/fair/prob5.html.

HIGH SCHOOL

Two cars each travelling at 60 kph at 2 km apart. They begin travelling toward each other at the same time. A very fast fly flies from the bumper of one car to the bumper of the other at 120 kph. As soon as it touches the bumper it turns around and heads back to the bumper of the first car. It continues back and forth until the two cars meet. How far does the fly travel?



Source: Adapted from Fowler, J. C. www2.spsu.edu/math/stinger/1-50/puz009.htm.