



## Problem of the Week

### Problem E

### Remainders

One day Gil and Aditi were doing some dividing. They noticed that when 20 000 is divided by 14, the remainder is 8. Gil further noted that when 20 000 is divided by 21, the remainder is also 8. Aditi noted that when 20 000 is divided by 34, the remainder is once again 8. There are in fact many positive five-digit integers that have the same remainder (not necessarily 8) when divided 14, 21, and 34.

How many positive five-digit integers have the same remainder when divided by 14, 21, and 34?

$$\begin{array}{r} 1428 \text{ R}8 \\ 14 \overline{)20000} \\ \underline{14} \phantom{000} \\ 60 \phantom{00} \\ \underline{56} \phantom{0} \\ 40 \phantom{0} \\ \underline{28} \\ 120 \\ \underline{112} \\ 8 \end{array}$$

