Problem of the Week
Problem C and Solution
Puzzling Products

Problem

In the product shown below, the letters F and L represent different digits from 1 to 9. Determine the value of F and L.

$$\begin{array}{r} F\,8 \\ \times \quad 3\,L \\ \hline 2\,7\,3\,0 \end{array}$$

Solution

In a multiplication question there are three parts: the *multiplier*, *multiplicand* and *product*. In our problem, $F8$ is the multiplier, $3L$ is the multiplicand, and 2730 is the product.

The units digit of the product 2730 is 0. The units digit of a product is equal to the units digit of the result obtained by multiplying the units digit of the multiplier and multiplicand.

So $8 \times L$ must equal a number with units digit 0. The only choices for L are 0 and 5 since no other single digit times 8 produces a number ending in zero.

However, if $L = 0$, the units digit of the product is 0 and the remaining three digits of the product are produced by multiplying $3 \times F8$. But $3 \times F8$ produces a number ending in 4, not 3 as required. Therefore $L \neq 0$ and L must equal 5.

We are then multiplying $F8$ by 35 to create the product 2730. To determine F we can work backwards. When we divide 2730 by 35, the quotient is 78. But 78 and $F8$ are the same number so $F = 7$.

$\therefore F = 7$ and $L = 5$.