

## Problem of the Week

### Problem D and Solution

#### Blocked Numbers

#### Problem

Twelve blocks are arranged as illustrated in the diagram. Each letter shown on the front of a block represents a number. The sum of the numbers on any four consecutive blocks is 25. Determine the value of  $B + F + K$ .

#### Solution

Since the sum of the numbers on any four consecutive blocks is the same, looking at the first five blocks, we have

$$4 + B + C + D = B + C + D + E$$

Subtracting  $B$ ,  $C$ , and  $D$  from both sides gives  $E = 4$ . Similarly, looking at the fifth through ninth blocks, we can show  $J = 4$ .

Again, since the sum of the numbers on any four consecutive blocks is the same, looking at the third through seventh blocks, we have

$$C + D + E + F = D + E + F + 5$$

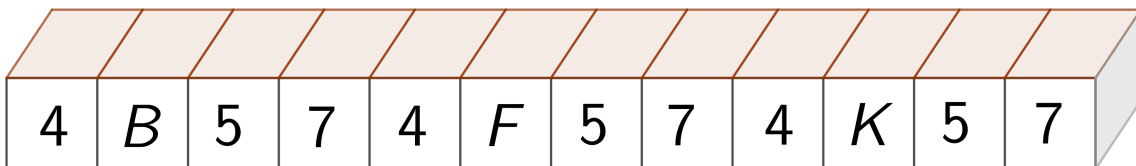
Subtracting  $D$ ,  $E$ , and  $F$  from both sides gives  $C = 5$ . Similarly, looking at the seventh through eleventh blocks, we can show  $L = 5$ .

Once more, since the sum of the numbers on any four consecutive blocks is the same, looking at the eighth through twelfth blocks, we have

$$H + J + K + L = J + K + L + 7$$

Subtracting  $J$ ,  $K$ , and  $L$  from both sides, gives  $H = 7$ . Similarly, looking at the fourth through eighth blocks, we can show  $D = 7$ .

Filling in the above information, the blocks now look like:



We will present two different solutions from this point.

**Solution 1:**

Since the sum of any four consecutive numbers is 25, using the first 4 blocks

$$4 + B + 5 + 7 = 25$$

$$B + 16 = 25$$

$$B = 9$$

Similarly, we can show  $F = 9$  and  $K = 9$ .

Therefore,  $B + F + K = 27$ .

**Solution 2:**

We note that the twelve blocks are three sets of four consecutive blocks. Each of these three sets have a total of 25, so the total sum of the blocks is  $3 \times 25 = 75$ .

The sum is also

$$4 + B + 5 + 7 + 4 + F + 5 + 7 + 4 + K + 5 + 7 = 48 + B + F + K$$

This means

$$48 + B + F + K = 75$$

or

$$B + F + K = 27$$

Therefore,  $B + F + K = 27$ .