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:

```
4  B  5  7  4  F  5  7  4  K  5  7
```

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

\[
\begin{align*}
4 + B + 5 + 7 &= 25 \\
B + 16 &= 25 \\
B &= 9
\end{align*}
\]

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, \( B + F + K = 27 \).