
Problem of the Week

Solution Three

The array below is part of a magic square, meaning that the numbers in each of the five rows have the same sum, and the numbers in each of the five columns also add up to that same sum. As you can see, many of the numbers have been left out. Your problem is to determine the number in the cell marked with an X:

	25		13	
14		2		20
	16		9	
10		23		11
	12		X	

SOLUTION:

	25		13	
14	•	2	•	20
	16		9	
10	•	23	•	11
	12		X	

Since this is a magic square, the sum of the second and fourth rows must be the same as the sum of the second and fourth columns. Notice that the four cells labeled with dark circles are common to both rows and both columns. Doing some preliminary addition, notice that: $14 + 2 + 20 = 36$, $10 + 23 + 11 = 44$, $25 + 16 + 12 = 53$ and $13 + 9 = 22$. Equating the sum of the two rows with the sum of the two columns now gives:

$$36 + 44 + \text{the four circles} = 53 + 22 + X + \text{the four circles}$$

This quickly simplifies to

$$80 = 75 + X,$$

from which we conclude that $X = 5$.