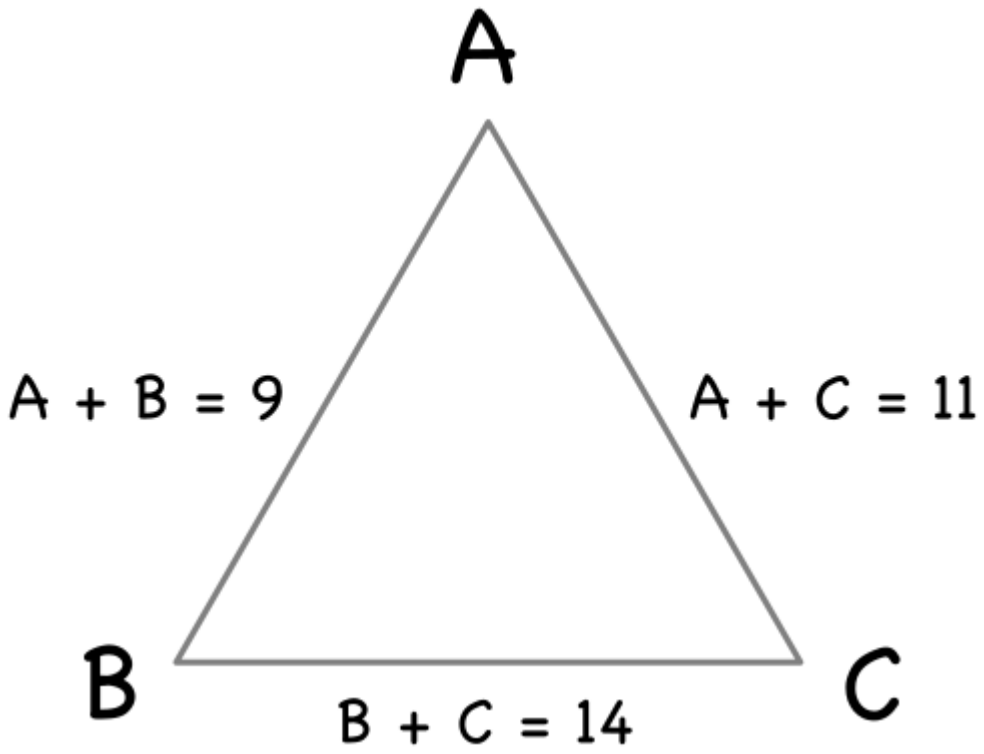
Puzzle of the Week
Mystery Sums – 1

THE CHALLENGE: There are secret numbers at the corners of a triangle. The sums of these numbers are written in the middle of each side. The numbers in the middle of the sides are: 9, 11, and 14. Find the secret numbers.



EXPLORATION: Make up a few of these problems for your friends. Can you come up with a general method for solving this kind of puzzle? Can you solve these for polygons with more sides?

Puzzle of the Week
Mystery Sums – 1 – Notes

THE CHALLENGE & EXPLORATION: By adding up all three of the middles, you will find twice the sum of all three numbers. If you then divide that by two, you will have the sum of all three numbers. If you then subtract each of the middle numbers from this sum, you will find the unknown numbers.

In our problem, (9 + 11 + 14) / 2 = 34 / 2 = 17. So the corner opposite the side with the 9 is 17 - 9 = 8. The corner opposite the 11 is 17 - 11 = 6, and the side opposite the 14 is 17 - 14 = 3.

For four-sided figures, there is not enough information to recover the original numbers on the corners. For example, the four corners {9, 4, 3, 7} produce the same sum information in the middle of the sides as {8, 5, 2, 8} and {7, 6, 1, 9}. For more than four sides, the situation gets even worse. Not every investigation produces exciting results, but it's good to explore.

We'll see in "Mystery Sums - 2" that the proper generalization of this triangle problem is to give all the sums for every possible pair of mystery numbers.