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Exercise Your Mind

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Target: 84

Values: [44, 40, 16, 24]

How to Play



Each side of this triangle has an equal sum. Insert the four values so that each side of the triangle adds up to 84.

For more information about this puzzle and its solution, turn the page. When you're ready for more puzzles like this one, see Having Fun with More Puzzles, on page ?.

About This Puzzle

Magic triangles are numbers laid out in the shape of a triangle's perimeter. The total of every side is equal. That equality makes the triangle "magic." In magic triangle puzzles, some values are left out or deliberately misplaced. You figure out where numbers go so each sum works and the triangle stays magic.

Solving the Example

Let's solve the triangle. The bottom row already has two numbers, so finish that row. Subtracting from 84, the answer must be 44. You can cross out numbers as you use them.



The second row is trickier. There's no simple math left, just logic. Look at the remaining numbers. Two values are pretty close to the ones in the bottom corners: 40 and 44, 24 and 28. Flip them to the opposite side and add them in. Balancing the sides is always a good strategy to try.



Finish with the final number 16 and check your sums. The total of each side must be equal. If not, go back and make some changes.



This puzzle is easy. It has only six numbers, and you know all the missing values and the magic sum. Puzzles can use a larger triangle, an unknown total, or missing or misplaced numbers. The small version of magic triangle puzzles is like a one-bite appetizer. More complex puzzles can be a meal.

Interesting Facts

A single magic triangle provides infinite variations. You can add to, subtract from, multiply, or divide by numbers without breaking symmetry. You can rotate and mirror however you like.

Try it yourself. All the original numbers are multiples of 4. Dividing by 4 creates another magic triangle. The new magic number target is 21, which is 84 divided by 4.



This next triangle subtracts the sample puzzle's numbers from 45. (45 is one more than the largest number in the original.) After subtraction, it's still a magic triangle. The new magic number is 51.



Any math that preserves symmetry in the triangle's values also preserves the "magic" in the triangle. Neat!

Other Shapes

Any polygon, whether a square, a pentagon, a hexagon, and so on, can be magic. Magic polygon possibilities are infinite, with as many sides and numbers per side as you'd like. For example, the following magic octagon contains groups of three numbers on eight sides. Its magic number is 79.



Nor are you limited to three or four values per side. Include as many items as you like (or as your drawing program permits). Check out this next square, for example. Its perimeter includes nine values on each of its four sides. Its magic number is 369. I don't think it would make a very good puzzle with that many numbers but, like the octagon, it is a beautiful thing to look at.

