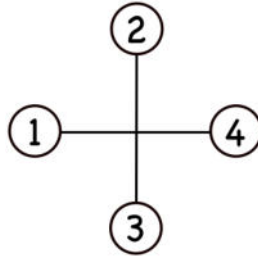


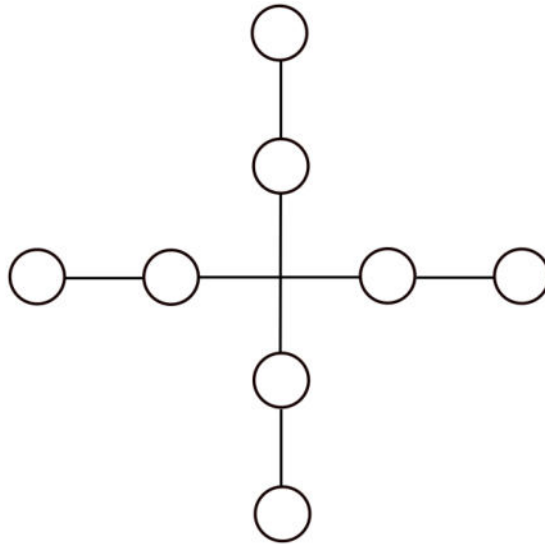
Puzzle of the Week

Magic Pluses

A *Magic Plus* is a plus sign with all the sums the same. This one uses the numbers from 1 to 4.



THE CHALLENGE: Make a Magic Plus with the numbers from 1 to 8.



1 2 3 4 5 6 7 8

EXPLORATION: What happens if you use 1 to 12 with three crossing lines of four circles? Play around with other configurations of circles.

Puzzle of the Week

Magic Pluses – Notes

THE CHALLENGE: Use this as the first “equal sum” puzzle. The Magic Flowers puzzles are slightly harder than this one.

This, like many of these Puzzles of the Week, can be attacked by playing around with the numbers until a solution is found. Don't be tempted to think that a more structured approach is better for your students – a great deal will be learned about the mathematics involved and about problem solving by tenaciously working through many examples. Finding a solution, by any method, is always a wonderful reward.

To approach this in a more structured way, start by calculating what the sums must be. The sum of the numbers from 1 to 8 is 36. Breaking this into two equal groups will mean each group has a sum of 18. At this point, there are lots of ways to do this and they all work. If you take any group of numbers that adds up to 18, the remaining numbers will as well.

The solutions are:

- (1 2 7 8) - (3 4 5 6)
- (1 3 6 8) - (2 4 5 7)
- (1 4 5 8) - (2 3 6 7)
- (1 4 6 7) - (2 3 5 8)

EXPLORATION: The analysis for using 1 to 12 is the same as before. The sum of 1 to 12 is 78. Breaking that into three equal parts gives a sum of 26 in each direction. There are a lot of solutions. Here are a few:

- (1 2 11 12) - (3 4 9 10) - (5 6 7 8)
- (1 2 11 12) - (3 5 8 10) - (4 6 7 9)
- (1 3 10 12) - (2 5 8 11) - (4 6 7 9)