Gaussian Elimination...

What is Gaussian Elimination?

It is the process of solving a set of simultaneous linear equations. For example, let m and n be any number. Then the set of equations:

$$m + n = 9$$

$$m + 3*n = 17$$

can be satisfied only for m=5 and n=4.

How to do Gaussian Elimination:

Rearrange the terms of the first equation by subtracting n from both sides to solve for m:

$$m = 9 - n$$

Substitute (9-n) for m in the second equation:

$$(9 - n) + 3*n = 17$$

Rearrange the terms of the above equation by solving for n:

$$-n + 3*n = 17 - 9$$

$$2*n = 8$$

$$n = 4$$

Substitute 4 for n in the equation "m + n = 9":

$$m + 4 = 9$$

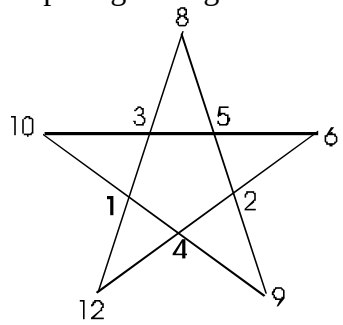
$$m = 5$$

Solutions...

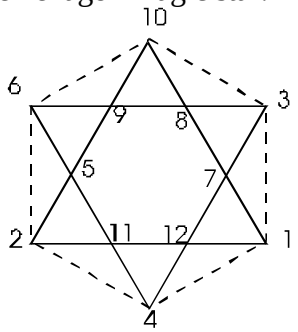
Solution to the magic square:

1	24	17	15	8
14	7	5	23	16
22	20	13	6	4
10	3	21	19	12
18	11	9	2	25

Solution to the pentagon magic star:



Solution to the hexagon magic star:



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Lunchbox Math Bytes

easy to digest mathematics for your lunchbox

Gaussian Elimination

You will need to pack:

1 Pencil

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Magic Squares, Stars, and other shapes.

A magic square is a table of numbers in which the sum of all the numbers in any row and the sum of the numbers in any column is the same number.

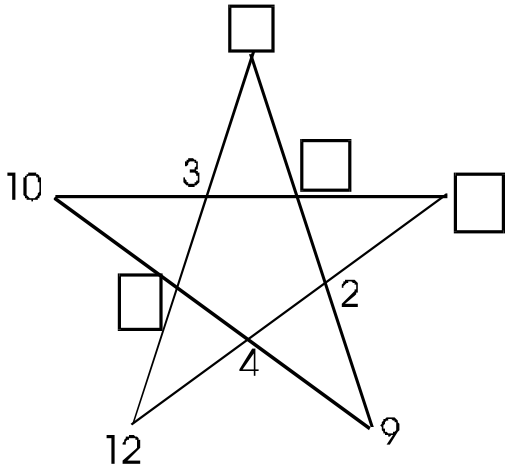
Magic Squares

Finish the magic square. The sum of the 5 numbers in any row is 65. The sum of the 5 numbers in any column is 65. The sum of the 5 numbers along a diagonal is 65.

1	24	17		8
14		5		16
	20	13		4
10		21	19	12
18	11	9	2	

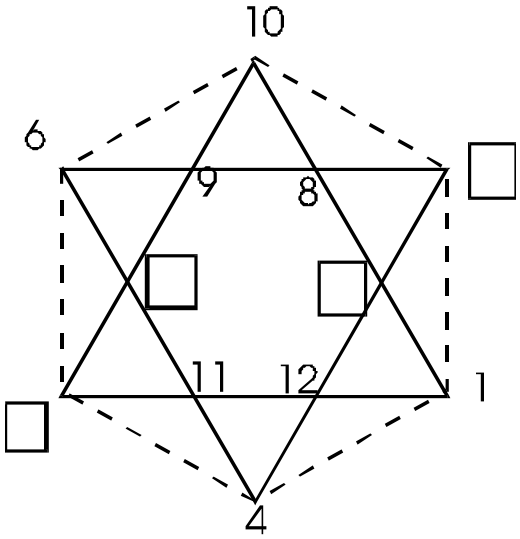
Magic Pentagon Stars

Find the missing numbers so that the 4 numbers on any edge add up to 24.



Magic Hexagon Stars

Find the missing numbers so that the 4 numbers on any edge add up to 26.



Solving The Puzzles

For the magic figures, substitute a different letter value for each blank. Write out the equations. First solve for the values that have only one unknown value. Then use those values in the remaining equations.

References

Gaussian elimination is a common tool for mathematicians. Whenever they get stuck they work it out with a pencil