

# Ideas for the Junior High Class

## Make Algebra Enjoyable

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It is important that the interest of students be kept alive. If you are looking for commercially prepared help, here is an idea. *Accent on Algebra* is an enrichment book designed for use with any level algebra student or in any course where algebraic topics are introduced and used. It contains 128 pages of crossnumber and crossword puzzles, word games and much more. It is available at Creative Publications.

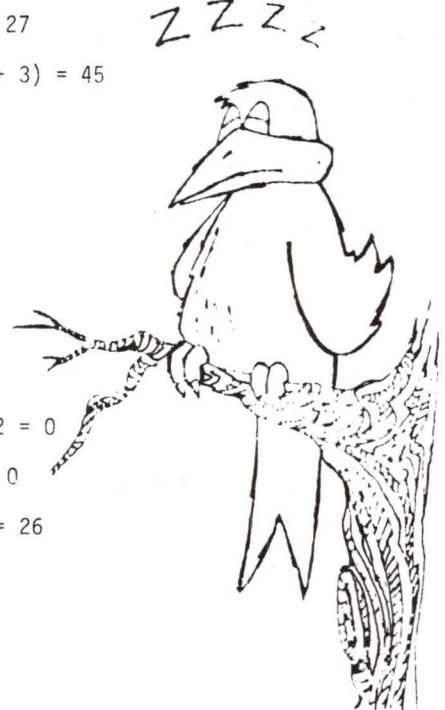
Try this sample when you teach equation solving:

FAMILIAR PHRASE

$\overline{6\ 11\ 20}$      $\overline{14\ 15\ 2\ 25\ 14}$      $\overline{6\ 20\ 30\ 6}$      $\overline{8\ 20}$      $\overline{9\ 6\ 11\ 20\ 15\ 20\ 10}$

$\overline{13\ 0\ 14\ 20\ 10}$      $\overline{30\ 20\ 0\ 24\ 20\ 30}$      $\overline{6\ 11\ 20}$      $\overline{9\ 5\ 5\ 20\ 12\ 0\ 10}$

SOLVE THE FOLLOWING EQUATIONS FOR SOME HELPFUL CLUES TO THE PUZZLE ABOVE.  
USE THESE CLUES TO COMPLETE THE PHRASE.

- |   |   |           |
|---|---|-----------|
| 1. $(a - 1) + a + (2 + 1) = 27$                         |  | a = _____ |
| 2. $(b + 1) + (b + 2) + (b + 3) = 45$                   |   | b = _____ |
| 3. $103 - 4d - 6d = 3$                                  |   | d = _____ |
| 4. $-85 - e + 4e = -25$                                 |   | e = _____ |
| 5. $2f - (f - 1) = 9$                                   |   | f = _____ |
| 6. $7(h - 9) - 3h + 19 = 0$                             |   | h = _____ |
| 7. $12.5 - 2(i + 2i) = 12.5$                            |   | i = _____ |
| 8. $4L + \frac{1}{2}(-6 - 2L) - 33 = 0$                 |   | L = _____ |
| 9. $5(m + 17) - 8(m + 1) - 2 = 0$                       |   | m = _____ |
| 10. $3(8n - 44) - 3(1 - n) = 0$                         |   | n = _____ |
| 11. $15o - (3o + 4) - (-3o) = 26$                       |   | o = _____ |
| 12. $2(2 - 3p) = 9(5 - p) + 1$                          |   | p = _____ |
| 13. $1 = \frac{2}{3}(9 - r) + 5$                        |   | r = _____ |
| 14. $1 - \frac{3}{5}(20 - s) = 7$                       |   | s = _____ |
| 15. $6t^2 - 3(t + 2t^2) + 18 = 0$                       |   | t = _____ |
| 16. $5z - [z - 2(z - 49) - 3 - z^2] = -(-25 - z - z^2)$ |   | z = _____ |

NOW THAT YOU HAVE DONE THE EASY PART, SEE IF YOU CAN SHORTEN THE PHRASE INTO A WELL-KNOWN PHRASE.

# Practice and Discovery: the Alternating Diagonal Hundred Square

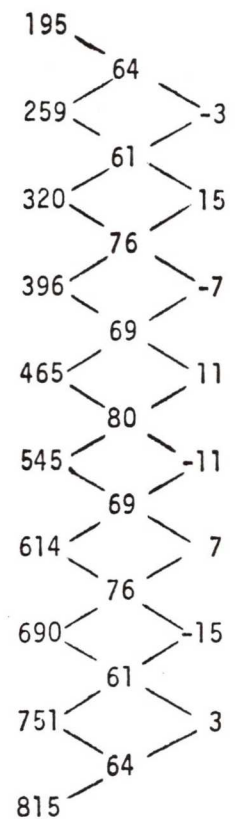
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Figure I: Alternating Diagonal Hundred Square

1	→	2		6	→	7		15	16	28	29	45	46
3	↘	5		8	↘	14		17	27	30	44	47	64
4	↓	9		13	↗	18		26	31	43	48	63	65
10	↘	12		19		25		32	42	49	62	66	79
11	↓	20		24		33		41	50	61	67	78	80
21		23		34		40		51	60	68	77	81	90
22		35		39		52		59	69	76	82	89	91
36		38		53		58		70	75	83	88	92	97
37		54		57		71		74	84	87	93	96	98
55		56		72		73		85	86	94	95	99	100

The Hundred Square is frequently used in middle school and junior high classrooms for discovering and reinforcing computational patterns. We wish to consider the "Alternating Diagonal Hundred Square" as shown in Figure I.

The arrows denote the order in which entries of the Square were listed. Several interesting patterns may be observed on the Square.



1. The sums of the entries of the rows (horizontal) and their consecutive differences are given to the right. Here and henceforth, the differences are found by subtracting the first number from the second.

Note the second differences form two interlocking symmetric sequences, one the negative of the other.

2. The sums of the entries of the columns (vertical) and their consecutive differences are:

Observe a similar pattern to that in I.

3. Figure II shows the sums of the entries of the indicated diagonals

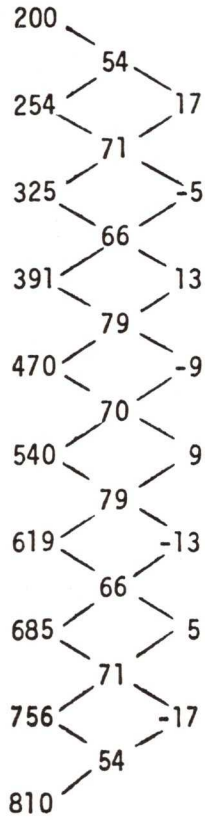
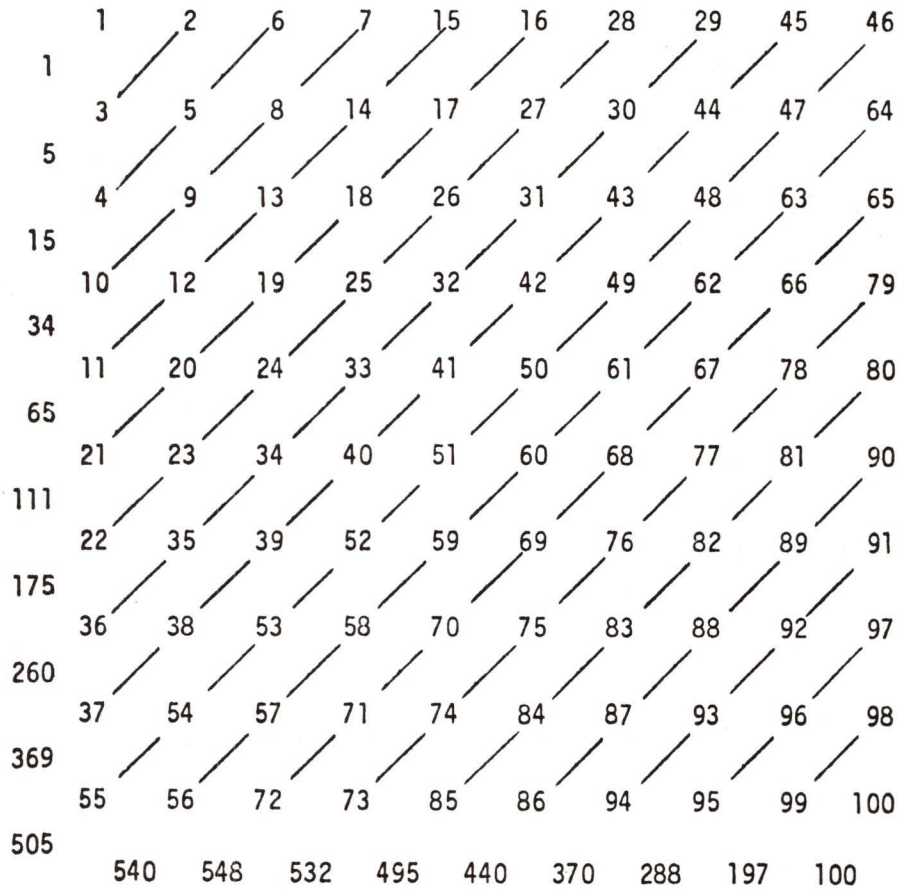
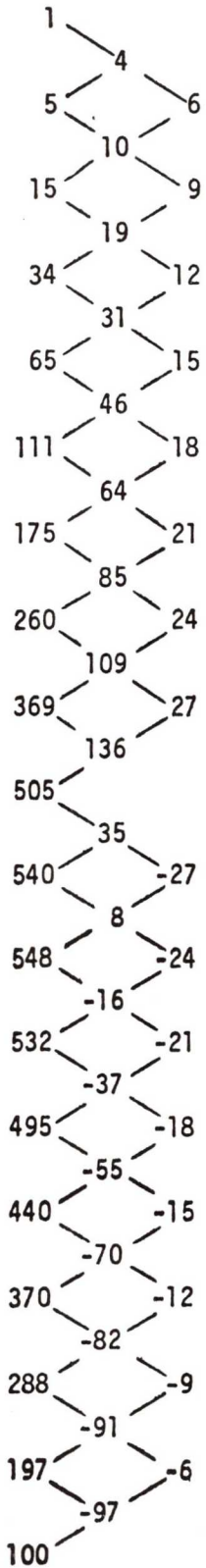


Figure II



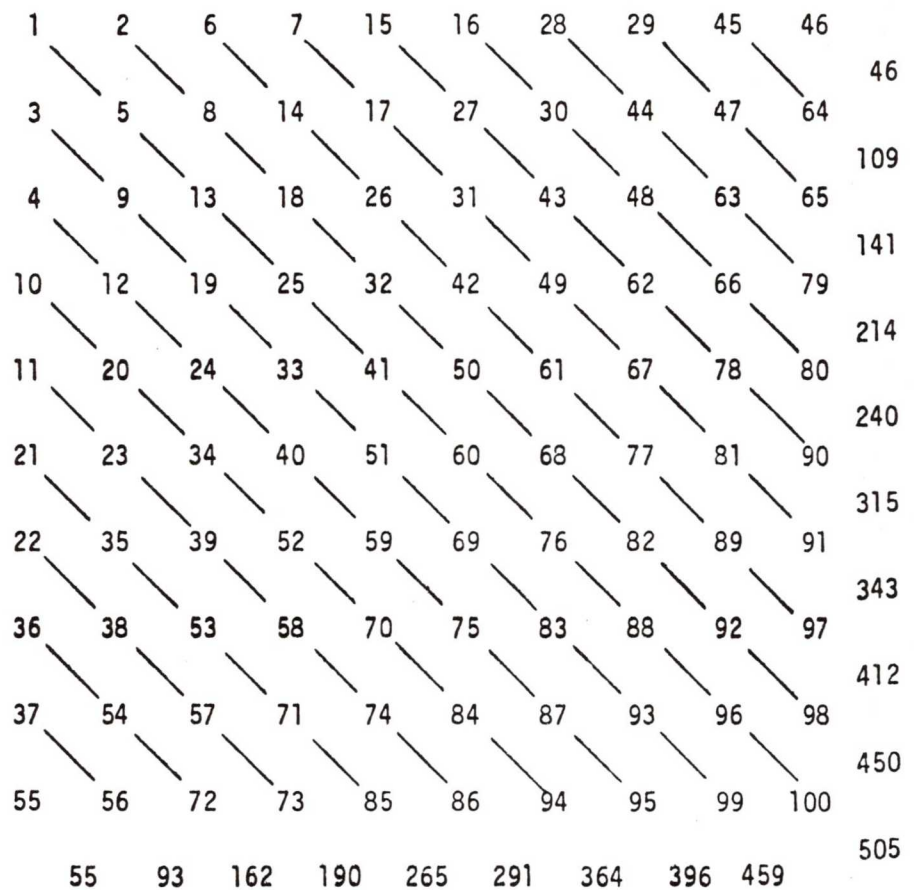
Consider the consecutive differences of the sums as shown.

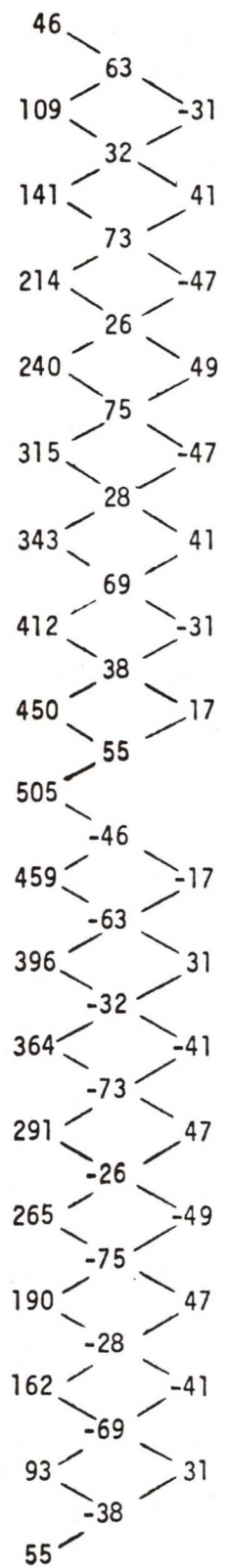
Again the second differences from two symmetric sequences, one the negative of the other.



4. Figure III shows the sums of the entries of another set of indicated diagonals.

Figure III





Again note the pattern of two symmetric sequences, one the negative of the other.

The teacher and her students are invited to seek other patterns on the Alternating Diagonal Hundred Square. These activities may be used for maintenance of skills, discovery of patterns, or even practice with the hand calculator.

