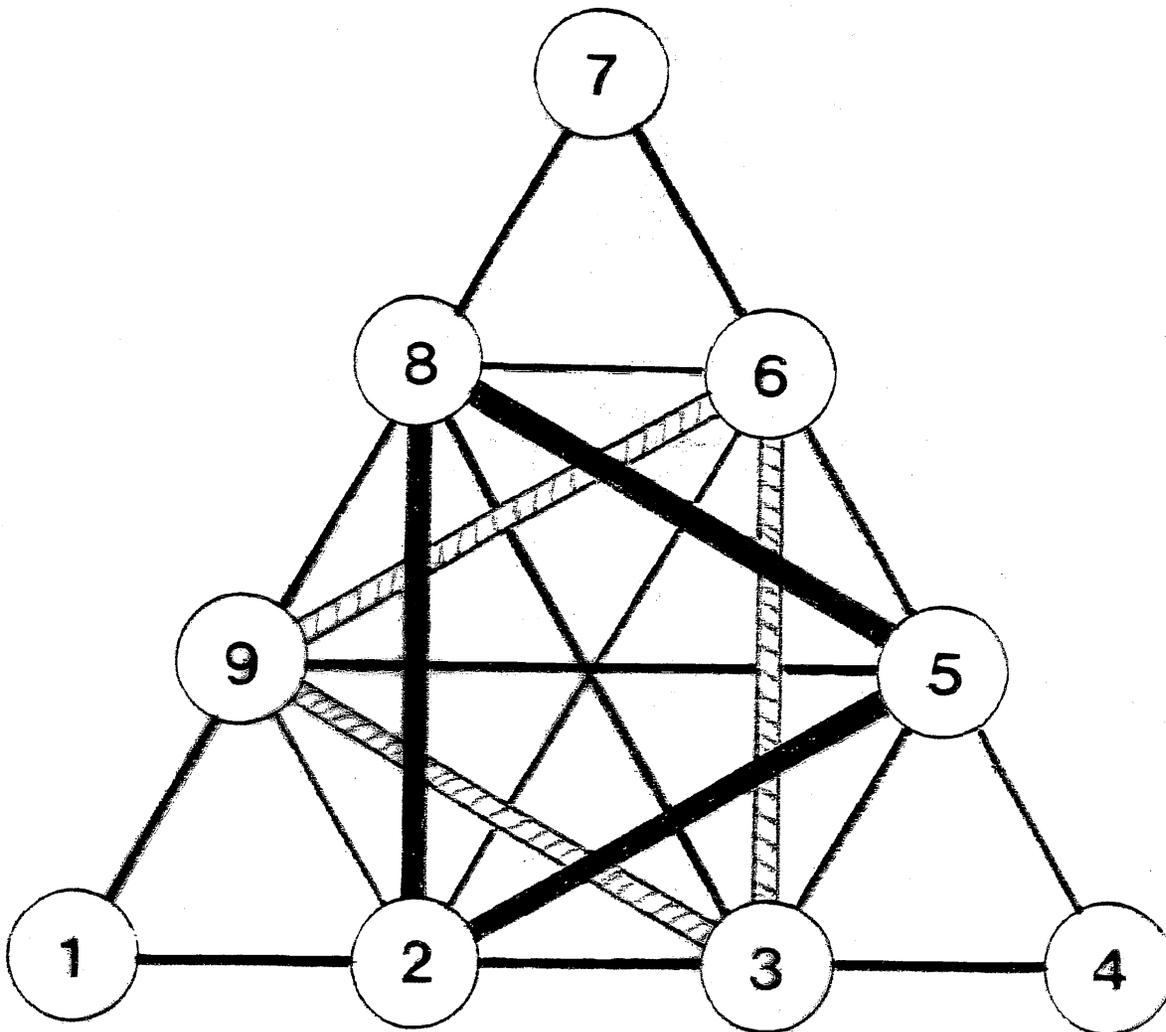# THE BROAD RIPPLE PUZZLE-GAME
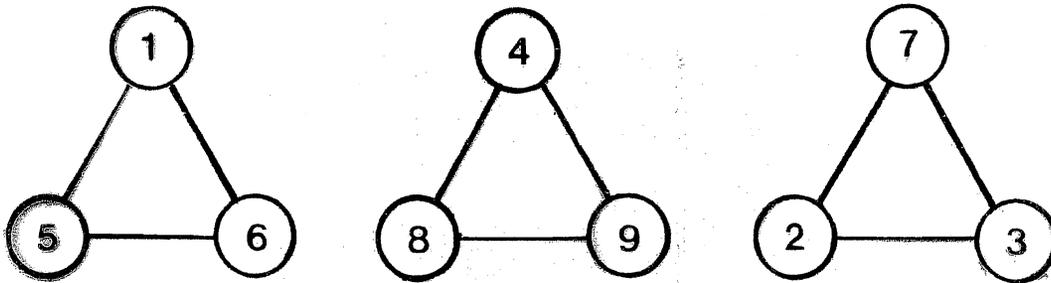
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As reported in the November issue of *Word Ways*, Peggy Boulden's class from Indianapolis' Broad Ripple High School recently visited Butler University for a presentation of mathematical word play. In addition to the magic spelling trick described in November we used the nine different letters in BROAD RIPPLE in the following word puzzle:

Place the nine letters on the nine nodes of the diagram so that each of the nine equilateral triangles holds three letters on their vertices that transpose into a three-letter word.

There are many solutions; we give our best one in Answers and Solutions.

The astute reader will notice that the nine triangles (3-gons) on 9 nodes, each node of which is on three triangles, makes the diagram into a (9,3) symmetric configuration. Therefore a nice two person game may be played on the diagram. The players alternately choose nodes and the player who first marks an equilateral triangle will win the game. First player to win, must do so in four moves. Games on configurations have been reported in *Word Ways* before (See (1) and (2)) and this game turns out to be isomorphic to the Pappus configuration with the following misgraph.

First can always win in 4 moves by either forcing second to waste a move in second's misgraph or by playing the remaining entry in first's misgraph if second has played there too. When you play as second we recommend playing in first's misgraph since first has then only one winning move.

(1) Jeremiah Farrell. Games on word configurations. *Word Ways: The Journal of Recreational Linguistics*, 27(4): 195-205, November 1994.

(2) Jeremiah Farrell. Puzzles and games on word configurations. *Word Ways: The Journal of Recreational Linguistics*, 34(3): 243-248, November 2001.

(3) Jeremiah Farrell. Martin Gardner's word magic enthralls Broad Ripple teens. *Word Ways: The Journal of Recreational Linguistics*, 42(4): 288-289, November 2009.