Peg solitaire is a board game that is played on a board with a specific layout of holes, with a certain number of pegs placed in these holes. The goal of the game is to remove all but one peg by jumping over adjacent pegs.

The mathematics of peg solitaire is based on the combinatorics of the possible moves that can be made on the board. The number of possible moves that can be made on a given board is determined by the number of pegs on the board and the layout of the board. The game can be solved by finding a sequence of moves that will leave only one peg on the board.

One strategy for solving peg solitaire is to work backwards from the final position, where there is only one peg left on the board. By analyzing the possible moves that led to this final position, it is possible to determine the sequence of moves that must be made to achieve it.

Another strategy is to use a graph theory approach, where each peg is represented by a vertex and each move is represented by an edge connecting two vertices. By analyzing the connectivity of the graph, it is possible to determine the sequence of moves that will leave only one peg on the board.

There are several variations of the peg solitaire game, and the strategy for solving each variation may be different. However, by understanding the underlying combinatorics and graph theory of the game, it is possible to develop a general approach to solving any variation of peg solitaire.

In summary, the mathematics of peg solitaire is based on the combinatorics and graph theory of the possible moves that can be made on the board. By understanding these principles, it is possible to develop a strategy for solving the game and leaving only one peg on the board.