

## Ambush

Ambush, (also known as Rithmomachia) is an ancient board game based the Mathematics of Pythagoras. It was once as popular as chess but is little known today.

The object is to be the first to reach over a certain number of points, (total value of opponents captured pieces), or to capture a certain number of pieces.

The pieces may move in a straight line in any direction. You cannot jump a piece. The round pieces move one square at a time, triangles three and the squares four. The pyramid is really a stack made up of other pieces and can move like any of its component pieces. Just click the left mouse button on a pyramid to cycle through its' components.

**Captures** - There are four ways to capture an opponents piece:

1. Ambuscade - Maneuver two pieces on either side that add up to that piece.
2. Siege - Surround an opponents piece on all four sides. The edge or corner of the board can be used to aid in a siege.
3. Meeting - If a piece of like number would land on a like numbered piece. e.g. if the round 9 was one space away from the triangular 9, the triangle would be captured. The round would not move. Drag & Drop on the piece to be captured.
4. Assault - A piece multiplied by the number empty spaces between it and opponents piece equaled that piece. e.g. if round 3 was separated from triangle 9 by 3 empty spaces the 9 would be captured. The 3 would occupy the captured the space that the 9 was on. Drag & Drop on the piece to be captured.

**To Win** - The first player to capture 6 pieces or pieces that total over 500 points wins. The literature describes other types of wins that involve achieving various combinations of geometric and numeric progressions. You might try this while playing another person.

## Commands

### Game

**New** - Starts a new game.

**Save** - Saves a game so play can be resumed later.

**Restore** - Retrieves a game previously saved with the save command.

**Pause** - Causes the computer to temporarily quit looking for the next best move.  
Resume play by..

**Repaint Screen** - If you double-click on a piece, little blue circles will appear in all the places it could move. This command allows you to clean up the screen afterward.

**Exit** - Leaves the game of *Ambush*.

### Move

**Hint** - The computer will show you your best move and give you the chance to make that

move or another one.

**Show Last** - Shows the last move made.

**Force** - Forces the computer to make the best move it has calculated so far.

**Undo** - Undoes the last move.

### Options

**Opponent** - Allows you to play another person instead of the computer.

**Difficulty** - Determines how many moves the computer will look at. Also is directly related to the time it will take for the computer to find its best move.

**Sound** - Turns sound effects on or off.

### Mouse Right Button

Clicking the right button over a piece will show the combinations that will capture that piece.

### Mathematical Trivia

Evens round pieces are even and odds are odd. The round pieces in the third column are the squares of those in the fourth. The triangles in the 2nd column are the sums of the rounds in the next two columns on the same row. The squares in the second column are formed by adding the respective triangles: i.e.  $15 = 9 + 6$  and  $45 = 25 + 20$ . The pyramids are formed by a sum of squares which are the values of their component pieces. i.e.  $91 = 6^2 + 5^2 + 4^2 + 3^2 + 2^2 + 1^2$  and  $190 = 8^2 + 7^2 + 6^2 + 5^2 + 4^2$ . The squares in the first column are obtained from the squares in the second column and the rounds in the fourth column from the following formula: round = n, square in second column = s then  $((2n + 1) / n + 1) s = \text{square in second column}$ .

Have fun.