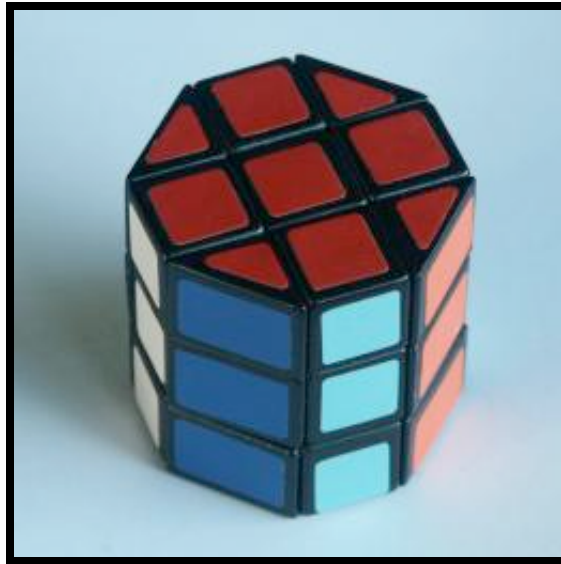


# Jaap's Puzzle Page

## Barrel/Octagon



This variation on the Rubik's cube is called the Magic Octagonal Prism, or just The Barrel or The Octagon. In Dutch it is called 'Peperbus', which means pepperpot. It is exactly the same as the normal cube except that the four vertical edges of the cube are truncated. The corner pieces of original cube now have only two colours and the four edge pieces in the middle layer have only one colour.

The differences make this puzzle a little confusing. It is possible to get to a position where it seems that two pieces need to be swapped or where one edge piece needs to be flipped, both of which are impossible on the original cube.

### The number of positions:

There are 8 corner pieces with 3 orientations each, 12 edge pieces with 2 orientations each, giving a maximum of  $8! \cdot 12! \cdot 3^8 \cdot 2^{12}$  positions. This limit is not reached because:

- The total twist of the cubes is fixed (3)
- The middle layer edge pieces show no orientation ( $2^4$ )
- The colours of the vertical columns are equivalent (4!)

This leaves  $8! \cdot 12! \cdot 3^7 \cdot 2^8 / 4! = 450,541,700,775,936,000$  or  $4.5 \cdot 10^{17}$  positions.

### Solution:

Use any solution method for the Rubik's Cube to solve it as far as possible. If you need to flip one final edge, then simply flip that edge and one of the shaved (monochrome) edges.

If you need to swap two pieces then swap any two of the shaved columns. For example if the shaved columns are vertical, then RLD2R'L' will swap the DF and DB edges.

Some people prefer to hold the puzzle so that the last layer they solve is one with two shaved edges (e.g. the

octagonal sides are at L and R). This way any final flips/swaps only involve pieces of the final layer.

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