

# Twice: A Sliding Block Puzzle

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*Twice* is a new concept in sliding block puzzles: Some blocks are restricted in their movements and can only reach certain parts of the board from particular directions or, in some cases, cannot get there at all.

The puzzle was invented by Dario Uri from Bologna, Italy, and was originally issued in 1989 with the name “Impossible!!” Subsequent additions and improvements made over the next couple of years led to a change of name, to “Twice.” The name was chosen because there are two quite different puzzles involving two different blocks numbered 2(a) and 2(b), one being used in each puzzle.

## Description

Fixed into the base of the board are four pegs, one in each corner (see Figure 1).

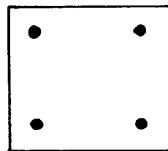


Figure 1.

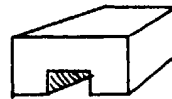


Figure 2.

There are nine square blocks (including two numbered 2), but only eight are used in each puzzle. Channels (or grooves) are cut into the bases of some blocks, allowing them to pass over the pegs in the corners (see Figure 2). Blocks can either have a horizontal channel, a vertical channel, both channels, or no channel at all. Blocks A, 7, and 2(b) have a single horizontal channel, and these blocks can only reach the corners from a horizontal direction. Blocks 4 and 2(a) have a single vertical channel and

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can only approach the corners from a vertical direction. Blocks 1 and 5 have both channels (in the form of a cross) and can go anywhere. Blocks 3 and 6 have no channels and cannot go into any corner.

### The Puzzle

Figure 3 shows the start position. The first puzzle uses block 2(a), and the second puzzle uses block 2(b). The object of the puzzle in each case is to move block A to the bottom right corner. The puzzles are both rated as difficult, the second being the harder of the two. It is quite an achievement just to solve them. For the expert, however, the shortest known solutions are 50 moves for the first puzzle and a staggering 70 moves for the second. Both solutions are believed (but not proved) to be minimum-move solutions.

<b>A</b>		<b>1</b>
<b>2</b>	<b>3</b>	<b>4</b>
<b>5</b>	<b>6</b>	<b>7</b>

**Figure 3.**

The delight of the first puzzle is that it is very easy to move block A to just above the bottom right corner, only to get hopelessly stuck.... So near, and yet so far! In puzzle 2 it is quite a task to move block A more than a square or two, or to get anywhere at all!

### Hints for Solving

In both puzzles the “nuisance” blocks are 3 and 6. Since they can’t go into the corners, they must only move in a cross-shaped area. During the solution they must continually be moved “around a corner” to get them out of the way of another block that has to be moved. Once this has been mastered, a plan can be made as to which blocks have to be moved so as to allow block A to pass. The real “problem” blocks are block 7 in the first puzzle and blocks 7 and 2(b) in the second. These blocks, as well as block A, can only move freely up and down the center of the puzzle. This causes something of a traffic jam, which has to be overcome....