

Digital Schoolhouse Puzzle Page

“If I had an hour to solve a problem I'd spend 55 minutes thinking about the problem and 5 minutes thinking about solutions”
Albert Einstein

Welcome to the Digital Schoolhouse Puzzle Page

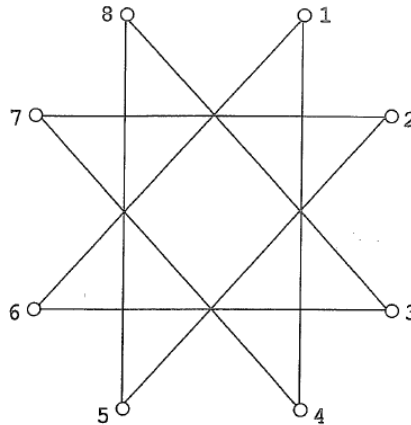
This month we will investigate placing Coins on a Star.

Coins on a Star

The objects of this puzzle is to place the largest possible number of coins at points on the eight-pointed star. The coins should be placed one after another, with the following rounds:

- a coin needs to be placed first on an unoccupied point and then moved along a line to another unoccupied point
- Once a coin has been positioned in this manner, it cannot be moved again.

For example, we can place the first coin on point 6 and then move it to point 1, where the coin will have to remain.

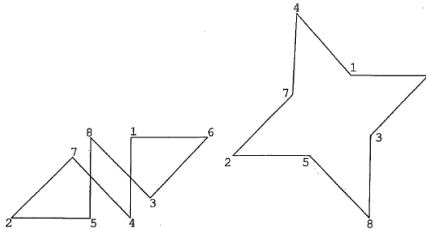


Answer:

The largest number of coins that can be placed is **SEVEN**.

One solution is: 6—1, 3—6, 8—3, 5—8, 2—5, 7—2 4—2

Alternatively, we solve the puzzle by “unfolding” the graph by “button and strings” method. Using this approach, several alternative solutions can be found.



Linkage to Computer Science

The solutions take advantage of the *greedy strategy* and a particular method of graph representation change, respectively. This puzzle is based on a series of puzzles referred to as the Octogram Puzzles.

Solutions

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6 | 9 | 8 | 4 | 7 | 1 | 2 | 5 | 3 |
| 4 | 1 | 2 | 7 | 8 | 5 | 6 | 3 | 9 |
| 8 | 7 | 1 | 4 | 2 | 4 | 6 | 3 | 8 |
| 7 | 8 | 6 | 9 | 1 | 3 | 4 | 2 | 5 |
| 4 | 8 | 6 | 5 | 7 | 9 | 3 | 6 | 1 |
| 8 | 2 | 4 | 3 | 6 | 9 | 5 | 1 | 7 |
| 5 | 7 | 9 | 1 | 4 | 3 | 6 | 2 | 8 |
| 2 | 3 | 5 | 8 | 9 | 6 | 7 | 4 | 1 |
| 6 | 9 | 8 | 4 | 7 | 1 | 2 | 5 | 3 |

Puzzle 36: (Hard, difficulty rating 0.66)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2 | 8 | 7 | 9 | 5 | 3 | 1 | 6 | 4 |
| 1 | 9 | 6 | 8 | 4 | 7 | 2 | 5 | 3 |
| 3 | 4 | 5 | 2 | 1 | 6 | 8 | 9 | 7 |
| 7 | 3 | 4 | 5 | 6 | 9 | 1 | 8 | 2 |
| 9 | 6 | 2 | 7 | 8 | 4 | 3 | 1 | 5 |
| 5 | 1 | 8 | 3 | 9 | 2 | 4 | 7 | 6 |
| 8 | 5 | 1 | 4 | 7 | 9 | 6 | 3 | 2 |
| 6 | 7 | 3 | 1 | 2 | 8 | 5 | 4 | 9 |
| 4 | 2 | 9 | 6 | 3 | 5 | 7 | 8 | 1 |

Puzzle 35: (Medium, difficulty rating 0.66)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4 | 5 | 6 | 9 | 1 | 2 | 7 | 8 | 3 |
| 1 | 9 | 6 | 8 | 4 | 7 | 2 | 5 | 3 |
| 6 | 9 | 5 | 8 | 7 | 4 | 3 | 2 | 1 |
| 8 | 9 | 7 | 6 | 5 | 3 | 1 | 2 | 4 |
| 4 | 7 | 6 | 5 | 3 | 1 | 2 | 8 | 9 |
| 9 | 6 | 2 | 7 | 8 | 4 | 3 | 1 | 5 |
| 7 | 8 | 1 | 4 | 7 | 9 | 6 | 3 | 2 |
| 5 | 1 | 8 | 3 | 9 | 2 | 4 | 7 | 6 |
| 8 | 5 | 1 | 4 | 7 | 9 | 6 | 3 | 2 |
| 6 | 7 | 3 | 1 | 2 | 8 | 5 | 4 | 9 |
| 4 | 2 | 9 | 6 | 3 | 5 | 7 | 8 | 1 |

Puzzle 34: (Easy, difficulty rating 0.32)

Puzzle 34: Easy

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 9 | | 3 | | | | 6 |
| 5 | | | | | | 9 | | 8 |
| | 4 | | 2 | 9 | | | | 5 |
| 2 | | 5 | | | | | 3 | |
| | | 1 | 5 | | 6 | 4 | | |
| | 6 | | | | | 8 | | 2 |
| 8 | | | | 5 | 3 | | 2 | |
| 1 | | 3 | | | | | | 9 |
| 4 | | | | 1 | | 7 | | |

Puzzle 35: Medium

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2 | | 6 | 3 | | | | 1 |
| | 7 | | 1 | | | | 4 | 9 |
| | 5 | 1 | | 7 | | 6 | | |
| | | | | | | 4 | | 6 |
| | | | 7 | 8 | 4 | | | |
| 7 | | 4 | | | | | | |
| | | 5 | | 1 | | 8 | 9 | |
| 1 | 9 | | | | 7 | | 5 | |
| 2 | | | | 5 | 3 | | 6 | |

Puzzle 36: Hard

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 8 | 4 | | | | 5 | 3 |
| 1 | | 7 | | 3 | | 8 | | |
| 2 | | | | | | | | 1 |
| 5 | | | 1 | | 8 | | | |
| | 2 | | 3 | | 9 | | 1 | |
| | | | 2 | | 7 | | | 4 |
| 7 | | | | | | | | 5 |
| | | 3 | | 2 | | 1 | | 8 |
| 4 | 1 | | | | 5 | 6 | | |