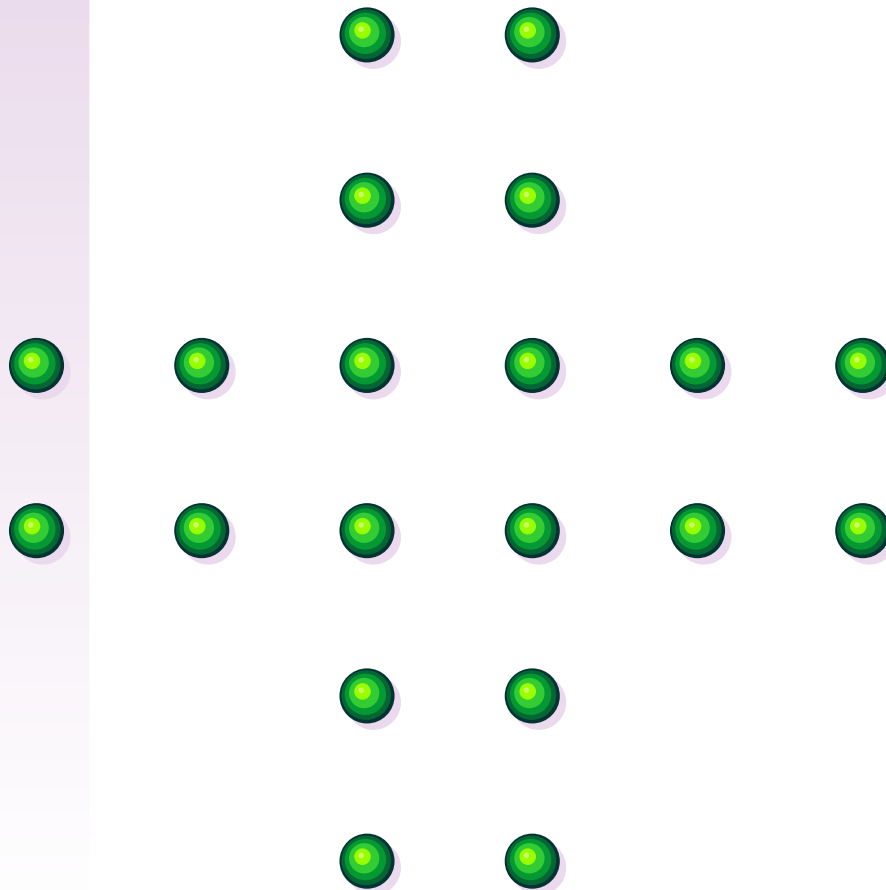


Treasure of Classic  
and Modern Puzzles

## Visual Puzzles



### How Many Squares?

*after Professor Louis Hoffmann*

**Puzzle 1.** Count how many perfect squares of all possible sizes are hidden in the cross of dots above. A square is counting if any four dots are placed exactly in its respective corners.

**Puzzle 2.** It is more difficult than previous one. You have to remove exactly 6 dots so that any four dots from those remaining would not lie in the corners of a square. So you'll get the "no-squares" position for which there are no four dots that form a perfect square.

November 29, 2004

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## Visual Puzzles

Diagram 1: A 3x3 square formed by 9 dots, labeled  $\times 9$ .

Diagram 2: A diamond-shaped square formed by 4 dots, labeled  $\times 4$ .

Diagram 3: A diamond-shaped square formed by 4 dots, labeled  $\times 4$ .

Diagram 4: A larger diamond-shaped square formed by 2 dots, labeled  $\times 2$ .

Diagram 5: A square rotated 45 degrees formed by 2 dots, labeled  $\times 2$ .

*Solution to Puzzle 1*

The five diagrams above show all the 21 perfect squares which can be found in the cross of 20 green dots.

## How Many Squares? (solution)

The answer to Puzzle 1 is 21 perfect squares. They are shown in the five diagram on the left.

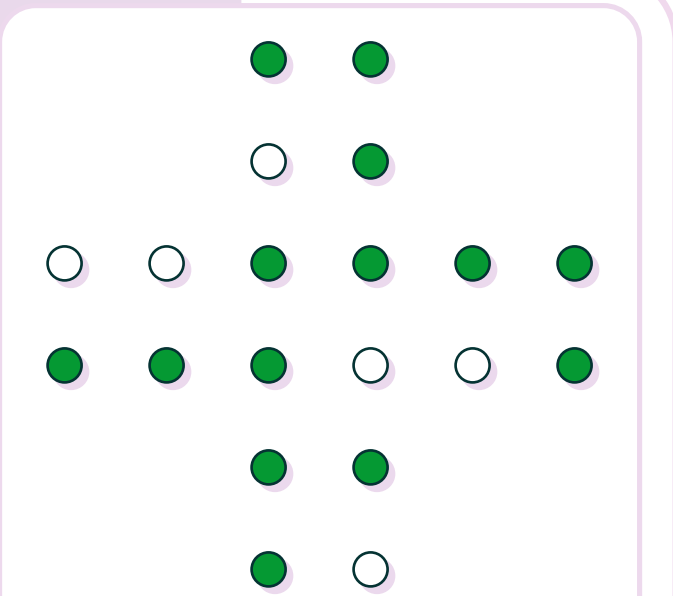
There is a nice story behind this ingenious old puzzle. It illustrates a tricky nature of Puzzle 1 very well.

In 1893 professor Louis Hoffmann asked in his famous book *Puzzles Old and New* to arrange twenty counters so that they form thirteen different squares, and in his original solution (he showed a pattern exactly as our big cross of 20 green dots) stated that there are seventeen perfect squares.

Several decades later, Henry E. Dudeney, England's greatest puzzle creator, improved Hoffmann's solution with 17 squares, and did this... twice - first it was a new solution with 19 squares, and then - 21. Both solutions were published in Dudeney's puzzle books.

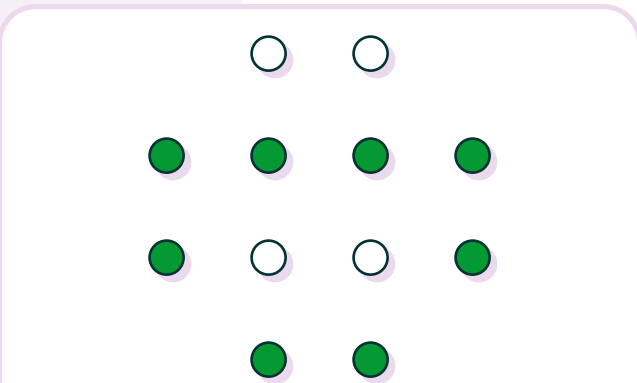
Treasure of Classic  
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## Visual Puzzles



### *Solution to Puzzle 2*

The diagram above shows "no-squares" position with the six dots removed.



### *Solution to Mini-Puzzle*

The diagram above shows "no-squares" position with the four dots removed.

The answer to Puzzle 2 which we show on the left is exactly as that from Hoffmann's book - not a single square remains. Moreover, all your correct solutions fully coincide with this old one!

The answers to the mini-version are the following:  
- there are 11 different perfect squares in the small diagram;  
- to break all them and get "no-squares" position you need to remove just four spots as shown in the illustration.