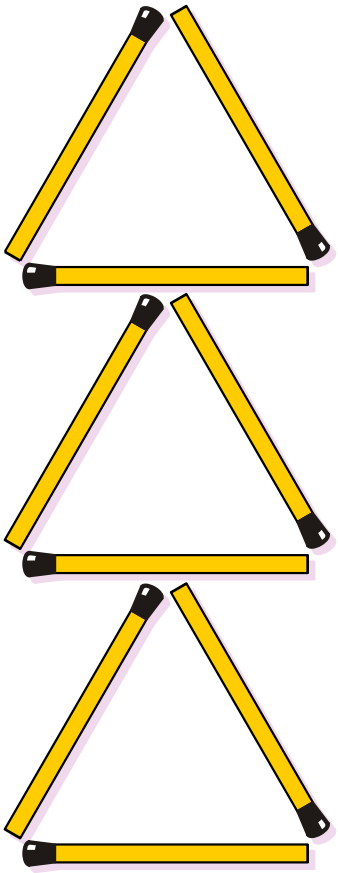
Puzzles.COM

Print 'n' Play Collection of 12

Puzzles.com

Print 'n' Play Collection of 12

Puzzles

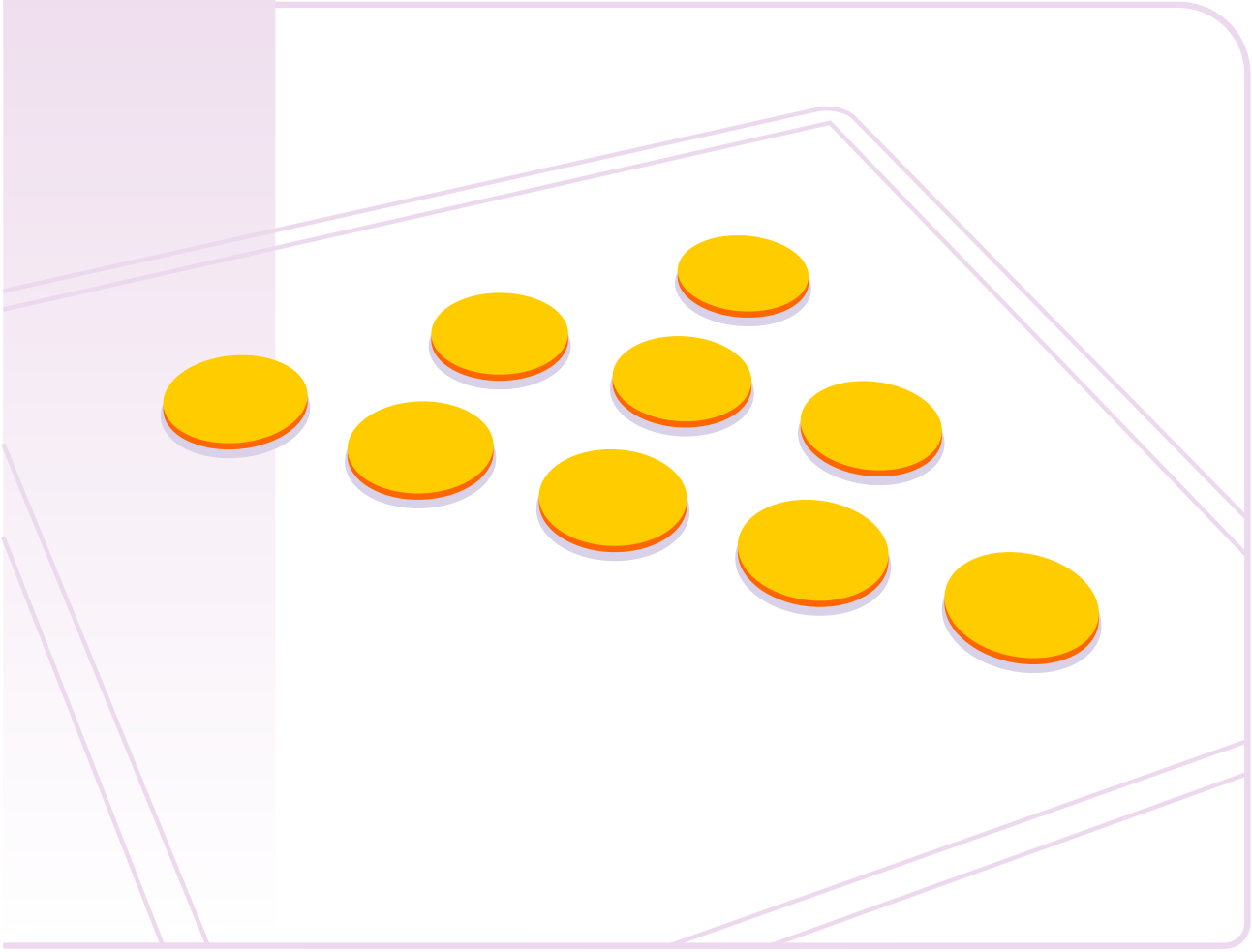


Christmas Tree

by Serhiy Grabarchuk, Jr.

The Christmas Tree shown in the illustration contains exactly three equilateral triangles.

The object is to move three matches so that to get four equilateral triangles.

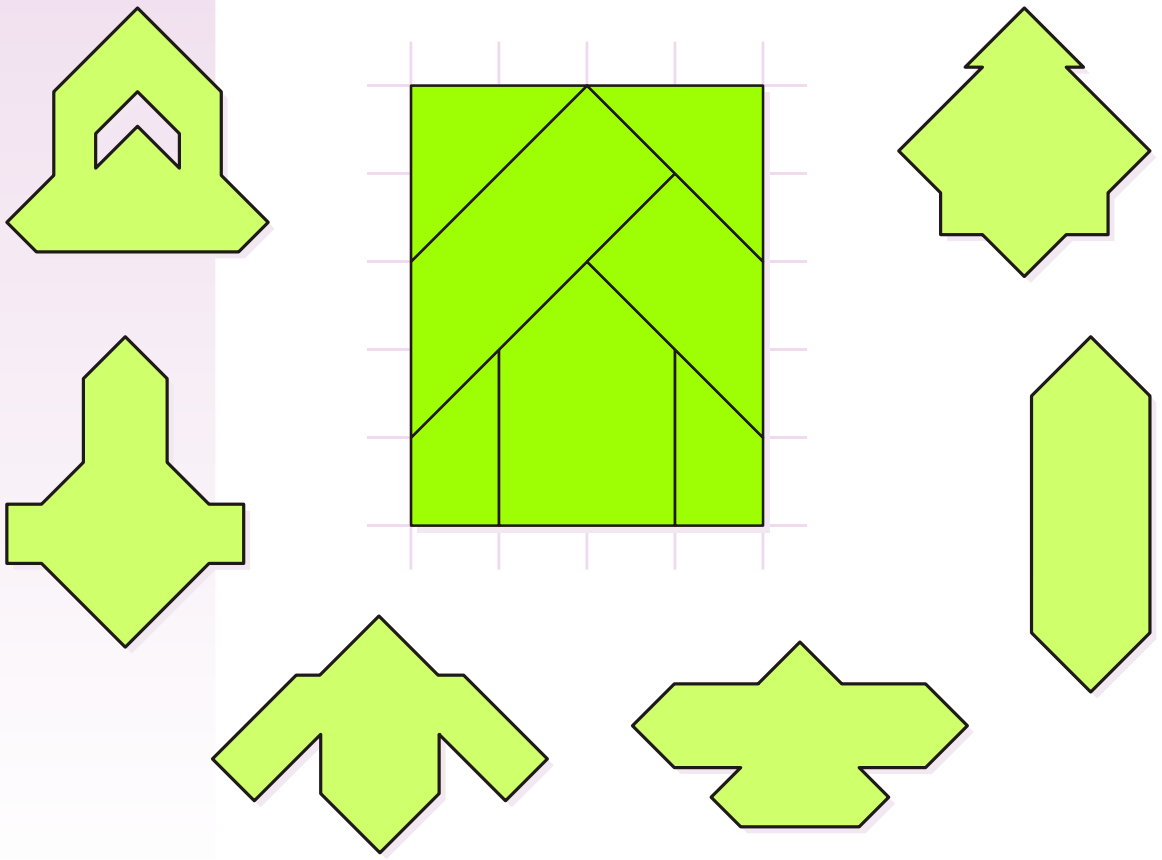


Coin Triangle

by Serhiy Grabarchuk

Change the triangle into a square by moving the minimum of the coins.

How many coins will you need to move to do this?



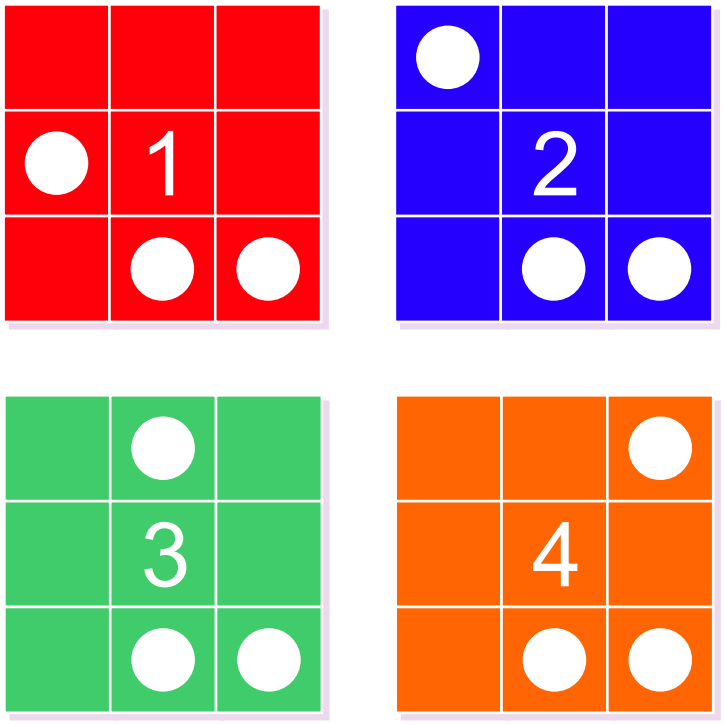
The Cross Breaker

F. A. Richter and Company manufactured this puzzle at the end of the 19th century.

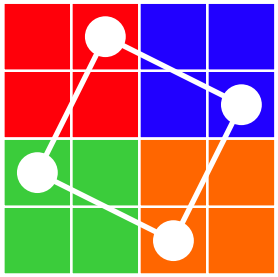
First produce the seven pieces that form the rectangle in the center above from the 28th page of this Print 'n' Play Version.

Now make the figures shown around the central rectangle using the whole set of the pieces for each of them. You're allowed to rotate the pieces as you wish, and even flip 'em over. But you can't overlap the pieces.

By the way, the story of this puzzle says these seven pieces were formed by breaking up a cross. Can you find such a cross as well?



1

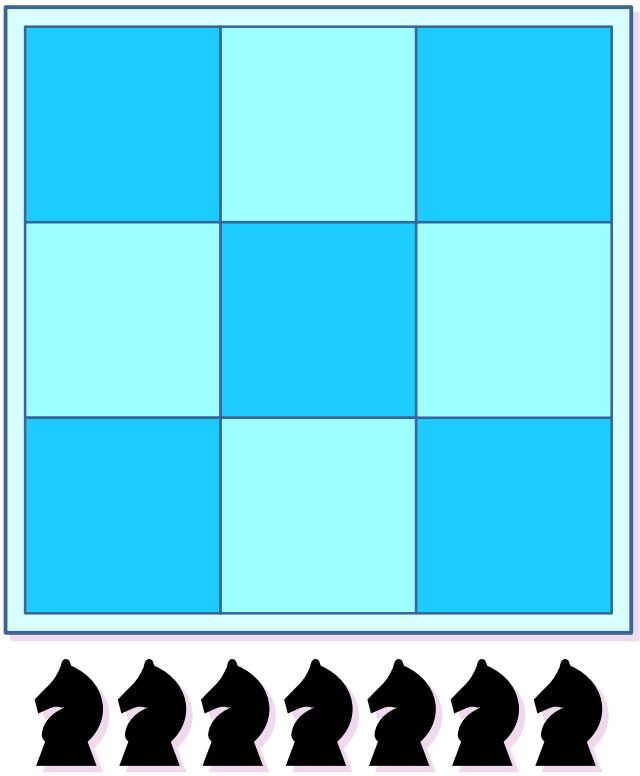


2

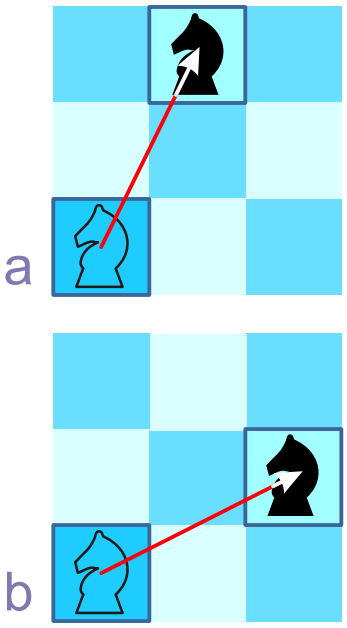
Squares 4 Four

by Peter Grabarchuk

Arrange the four pieces shown in Figure 1 (the pieces for printing out can be found at the 29th page of this Print 'n' Play Version) into the 2x2 square so that four squares formed of the white dots appear. A square is formed when four dots lie in its respective corners (as shown in Figure 2 above).



1



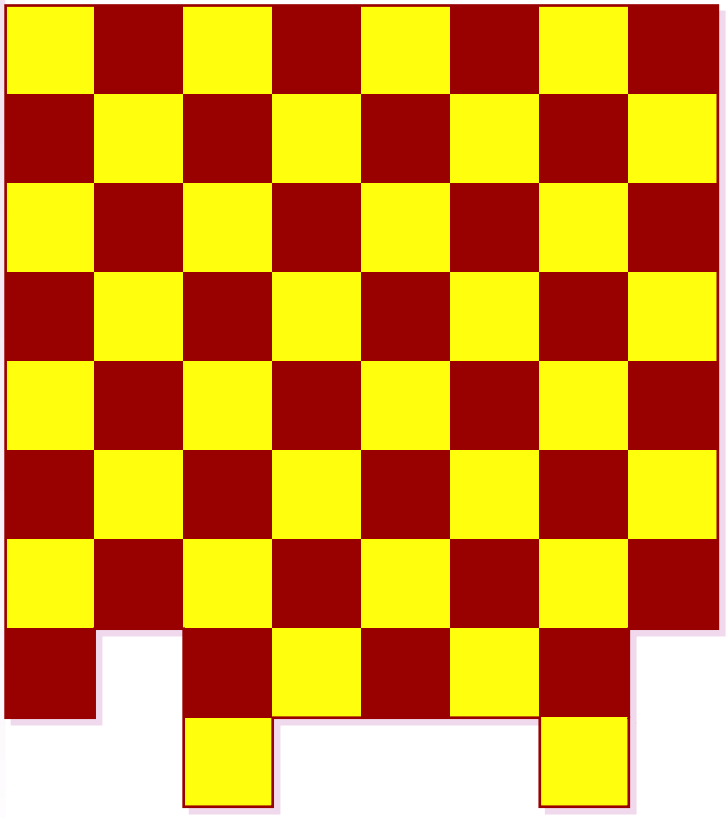
2

The 7 Knights Problem

You have 7 chess knights (Figure 1). Place one of them on any empty cell of a 3x3 board and then move it to another empty cell using knight's move (some examples of such moves are shown in Figure 2, a and b).

Then in exactly the same way place and then move another knight. Repeat your "place-move" steps till you have all 7 knights placed on the board.

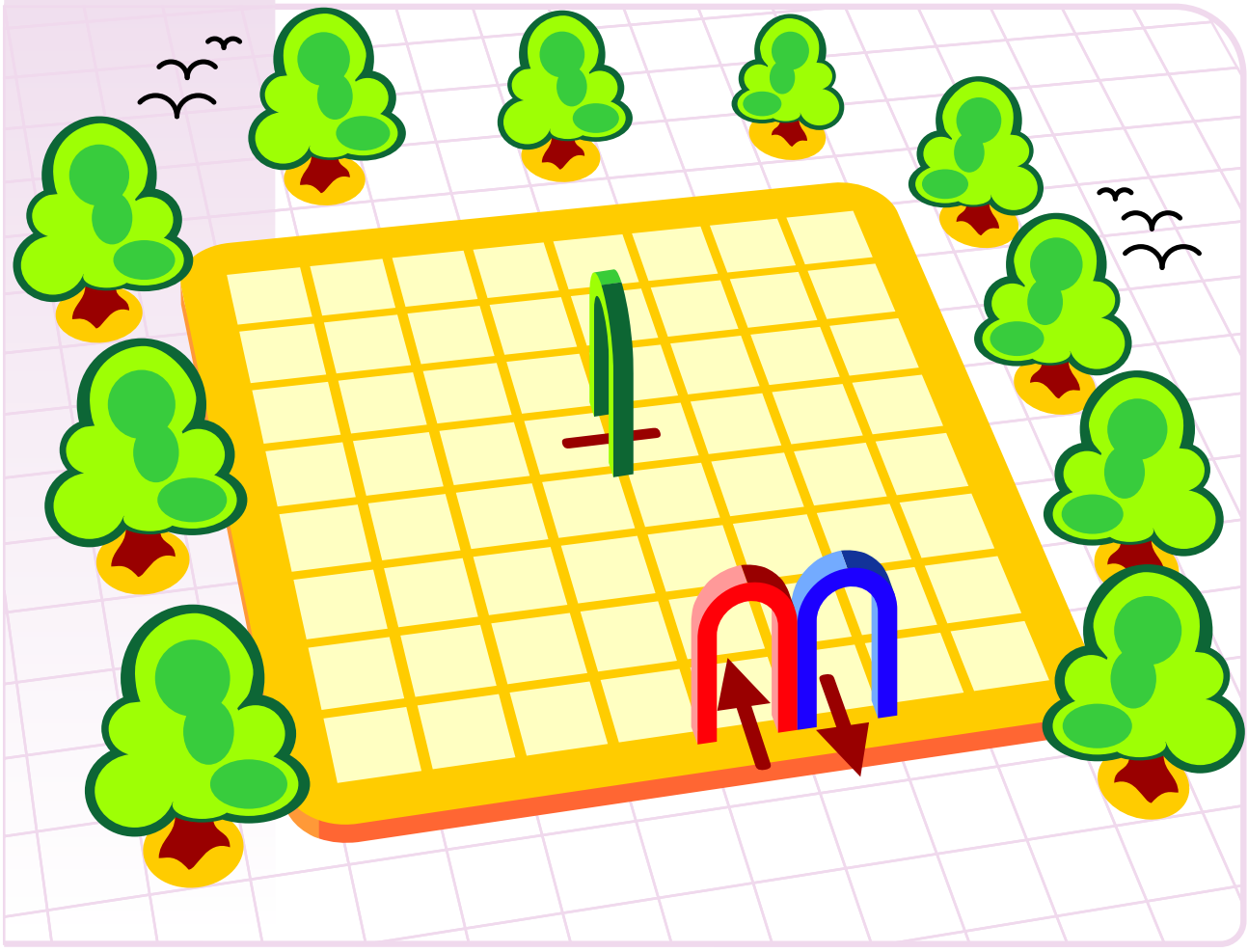
To practice you may use our printable 3x3 board (30th page of this Print 'n' Play Version) and 7 coins.



Improvised Chessboard

by Henry E. Dudeney

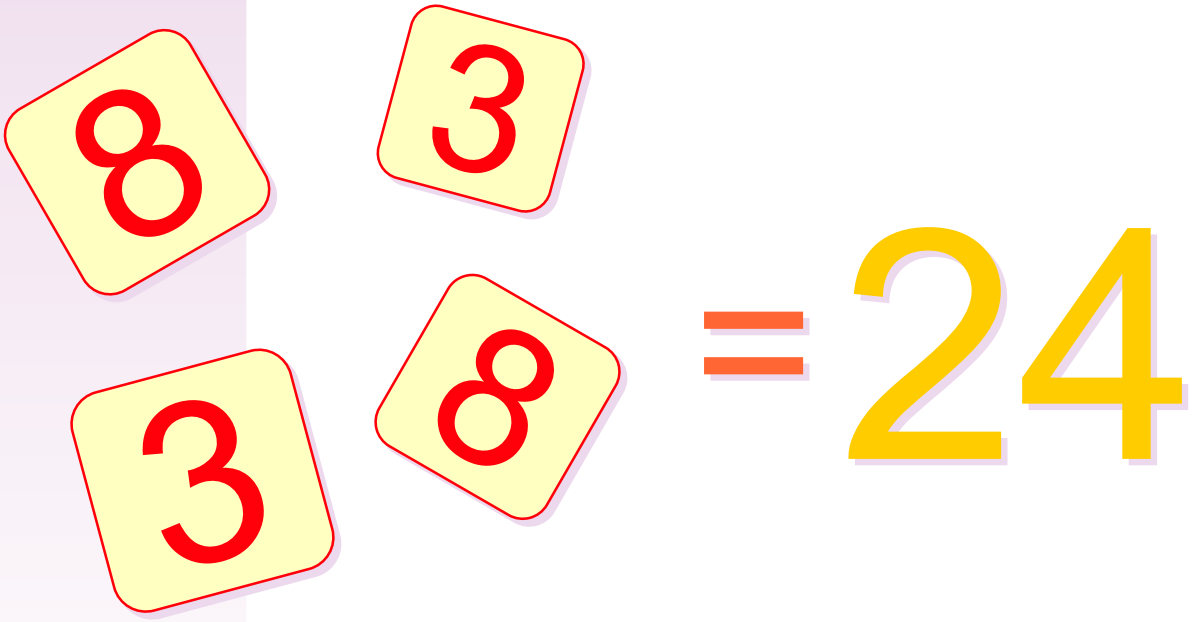
Two light squares have been cut off the 8x8 chessboard and pasted to it again into the new places as shown in the illustration. Now the object is to divide this board into only two pieces that will form a perfect chessboard again.

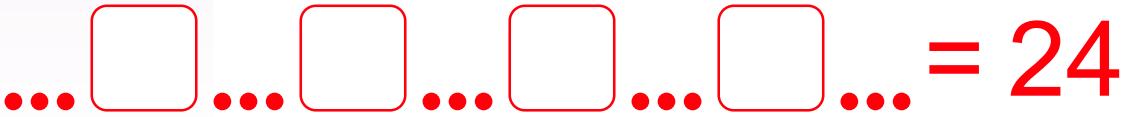


Puzzling Journey 2

by Sam Loyd

The goal is to draw a path that goes through each of the 64 cells of the board only once. The path must enter the board at the ***red*** gate, pass under the ***green*** gate in the center of the board and leave it at the ***blue*** gate. Your path must go horizontally and vertically (never diagonally).





Twenty4 puzzle*

by Wei-Hwa Huang

The object of this puzzle is using the four numbers 3,3,8, and 8 as shown in the illustration and the usual arithmetic operations (plus, minus, multiply and divide) make exactly 24. Of course, you can use brackets, but no tricks like powers, cube roots, or putting 8 and 3 to make 83 are allowed. Just pure maths.

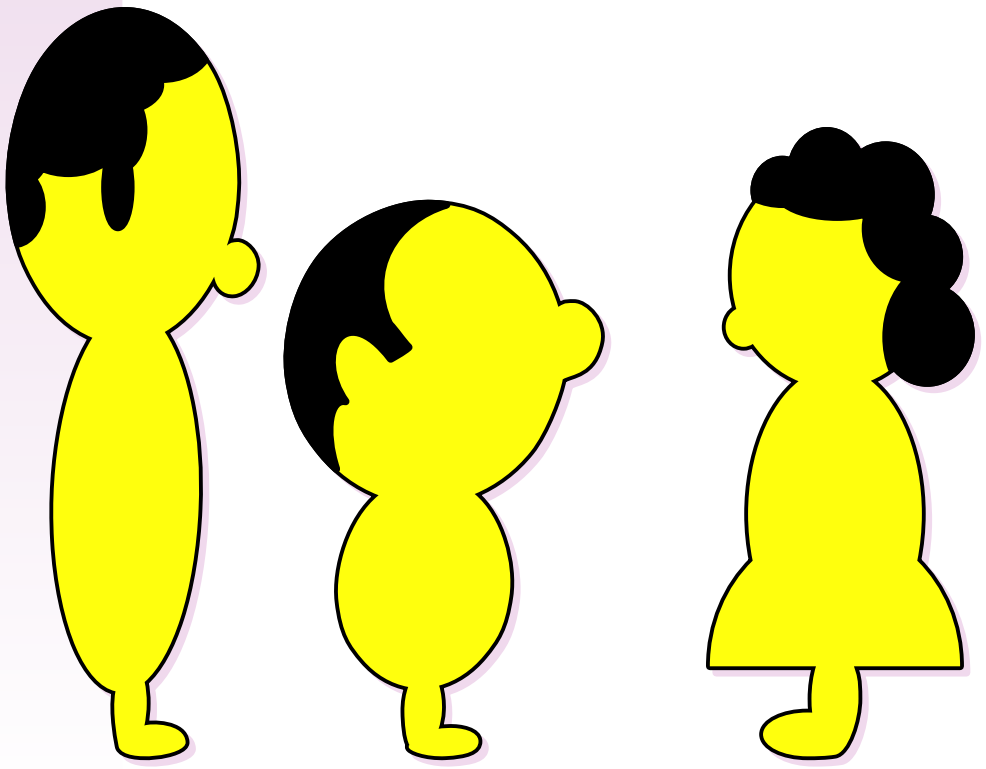
---

*This puzzle was inspired to the publication on our site by a message from Kim C.

An Easy One

after Professor Louis Hoffmann

Rearrange these letters in such a way that to make one word.



Colored Names & Hair

after Martin Gardner

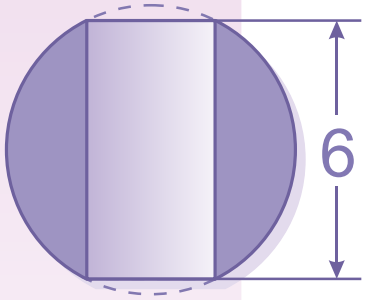
Professor Merle White of the mathematics department, Professor Leslie Black of philosophy, and Jean Brown, a young stenographer who worked in the university's office of admissions, were lunching together.

"Isn't it remarkable," observed the lady, "that our last names are Black, Brown and White and that one of us has black hair, one brown hair and one white."

"It is indeed," replied the person with black hair, "and have you noticed that not one of us has hair that matches his or her name?"

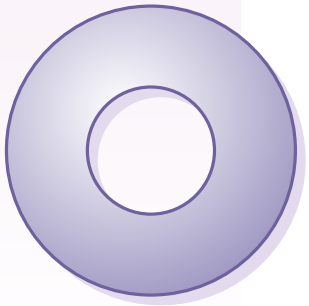
"By golly, you're right!" exclaimed Professor White.

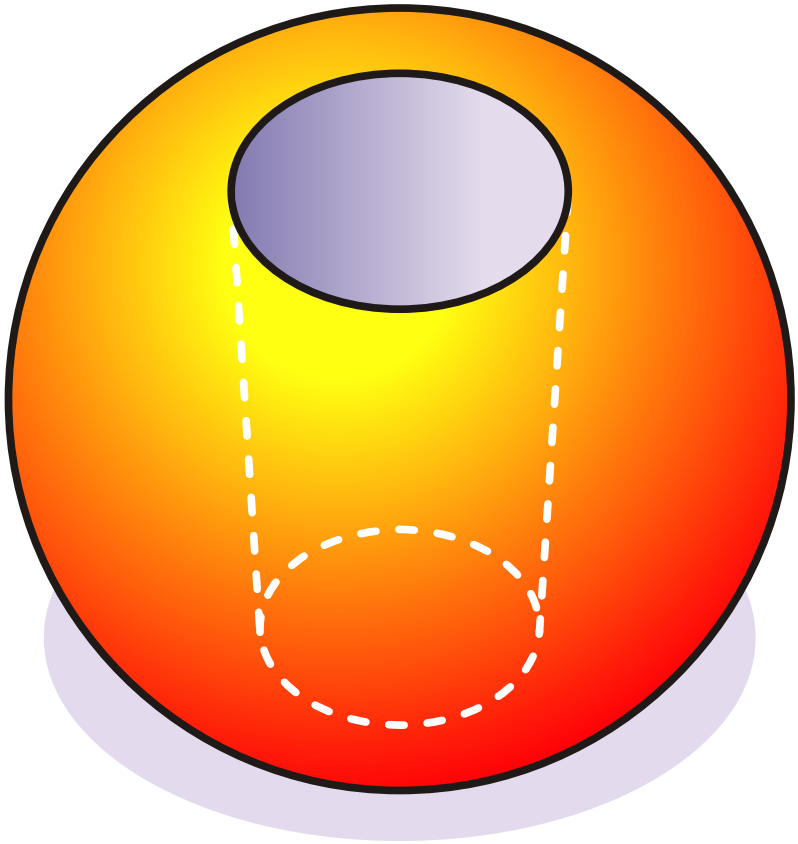
If the lady's hair isn't brown, what is the color of Professor Black's hair?



Cross section

Top view





Hole in the Sphere

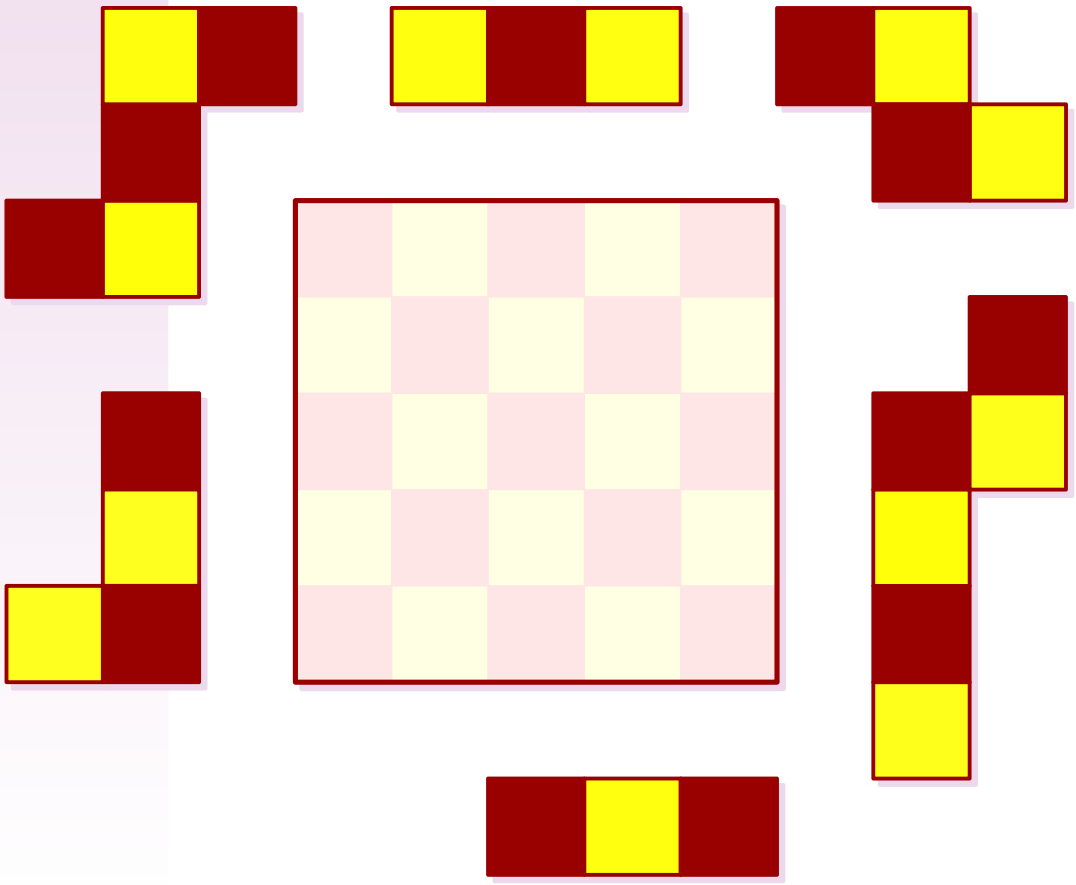
*by Samuel I. Jones**

A cylindrical hole six inches long has been drilled straight through the center of a solid sphere - just as shown in the illustration.

What is the volume remaining in the sphere?

---

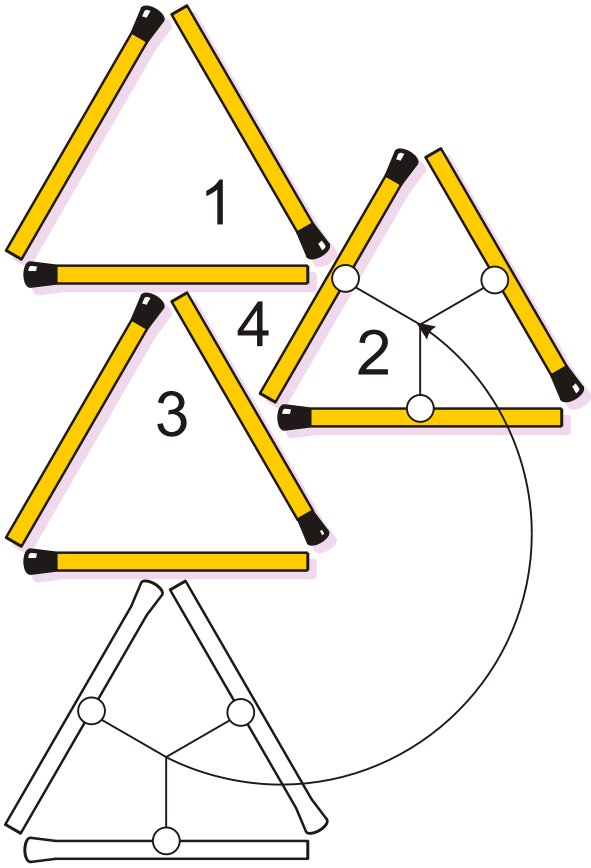
*Martin Gardner has found the earliest reference for this problem in Samuel I. Jones's *Mathematical Nuts*, self-published, Nashville, 1932.



Broken Checkerboard

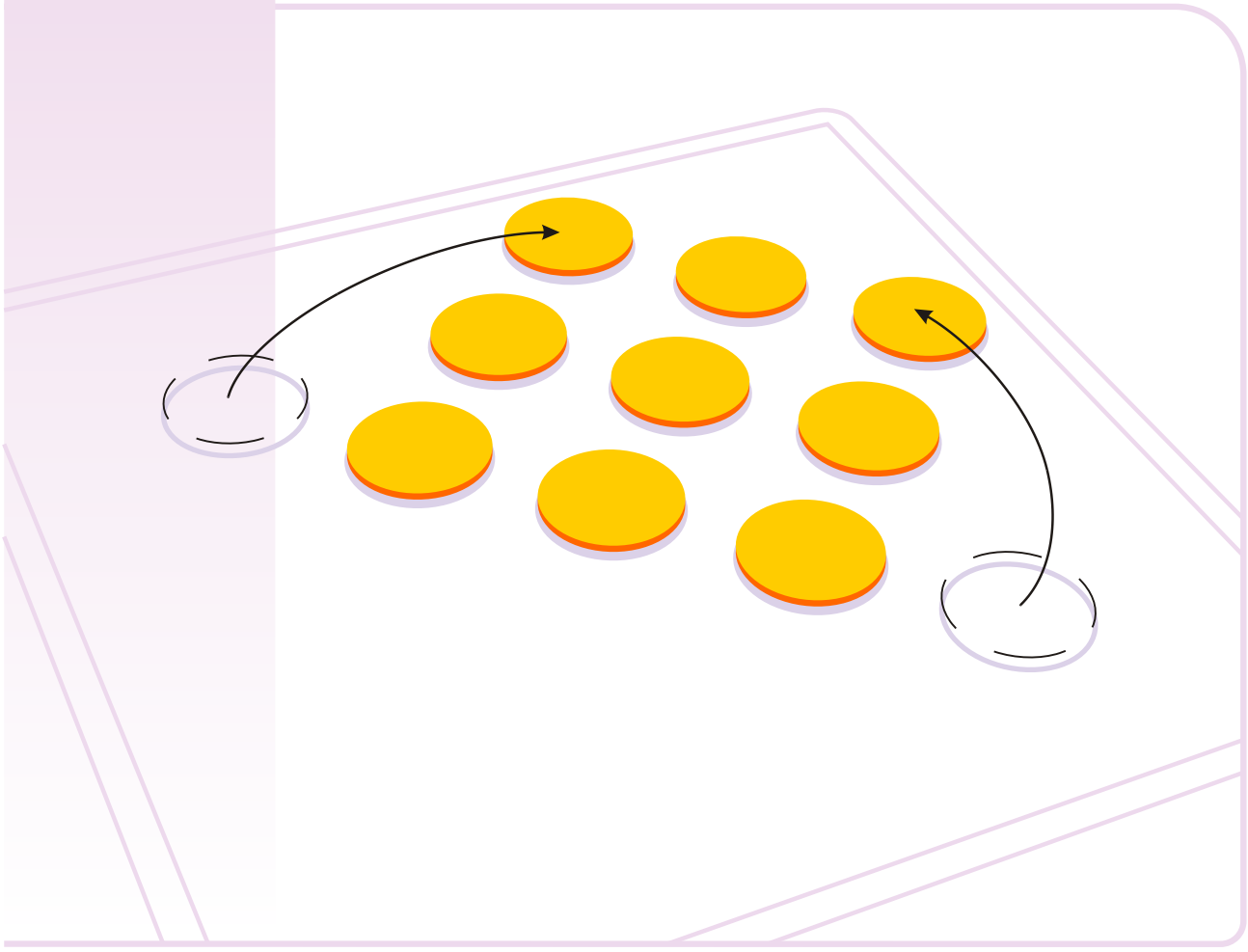
Rearrange the six pieces so that to form the 5x5 checkerboard shown in the center of the illustration (the pieces for printing out can be found at the 31st page of this Print 'n' Play Version).

Print 'n' Play Collection of 12
Solutions



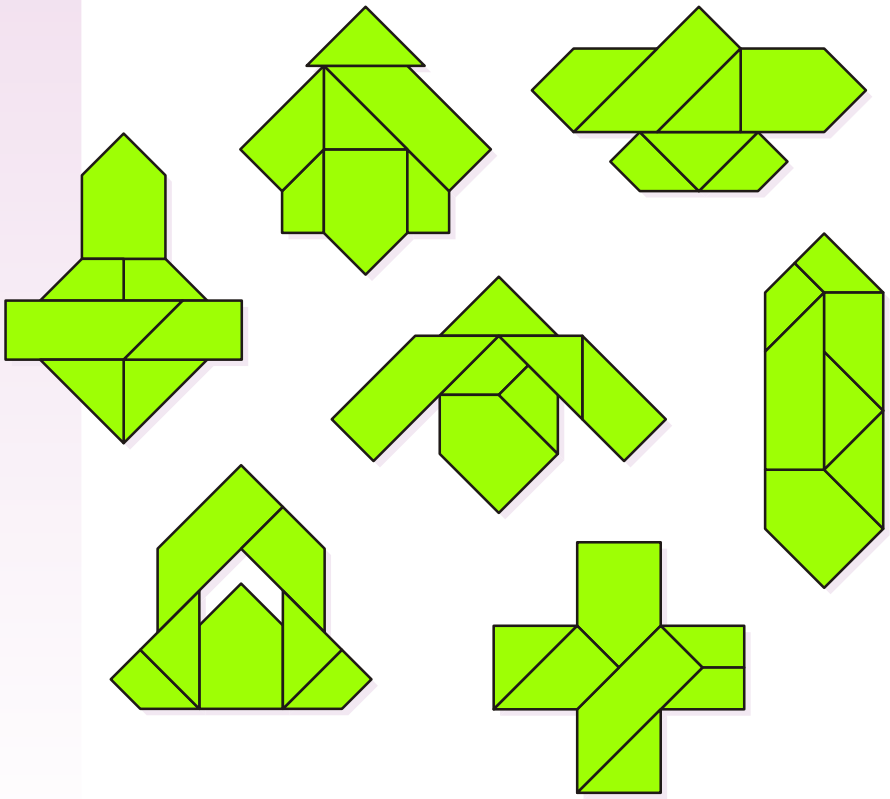
Christmas Tree (solution)

One of the basic solutions is given in the illustration. When you move the entire bottom triangle of three matches to the new position as shown, the three initial triangles remain plus one additional, smaller, equilateral triangle appears.



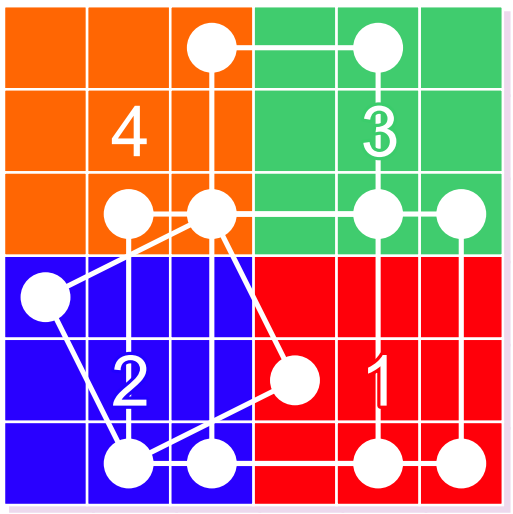
Coin Triangle (solution)

The two coin solution is shown in the figure above.

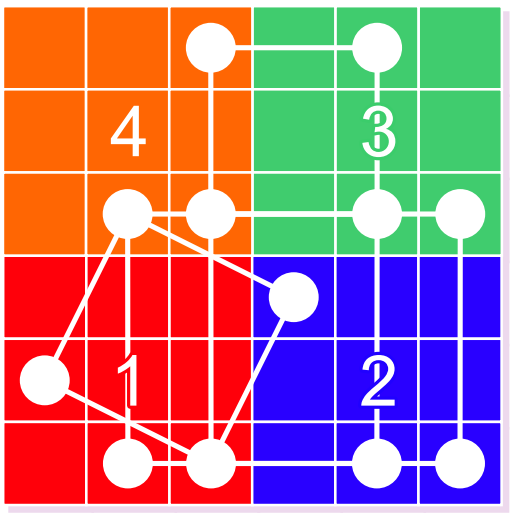


The Cross Breaker (solution)

Solutions to all the six figures plus the cross are shown in the illustration.



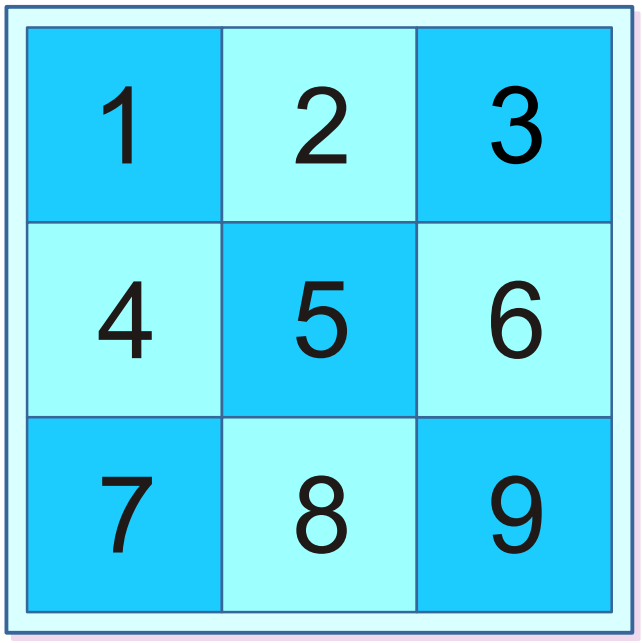
1



2

Squares 4 Four (solution)

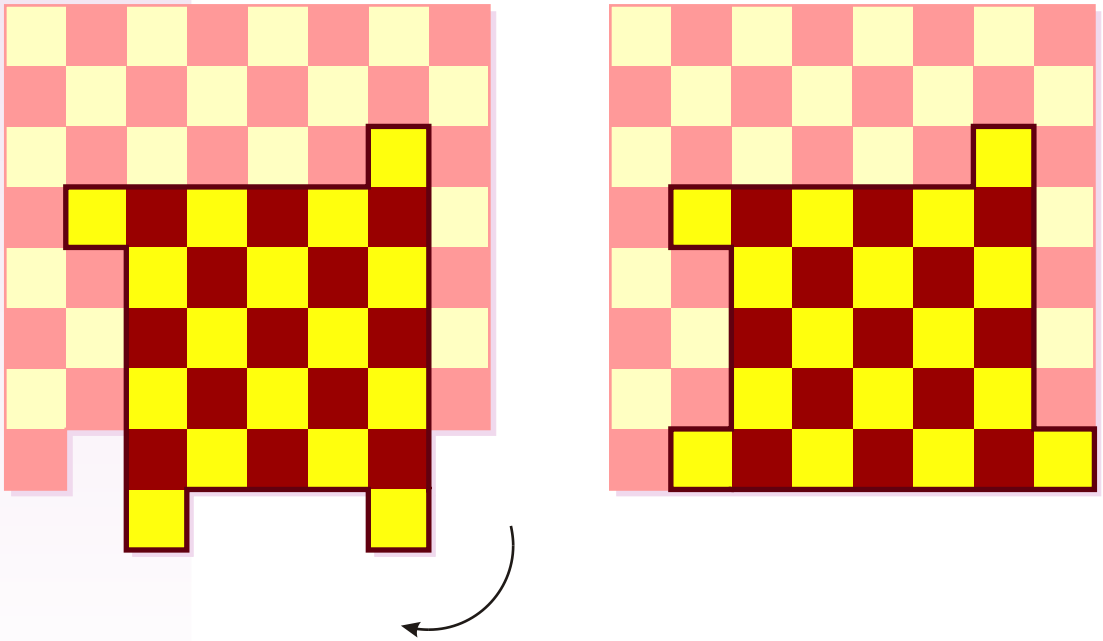
The two solutions to this puzzle are shown in the illustration.



The 7 Knights Problem (solution)

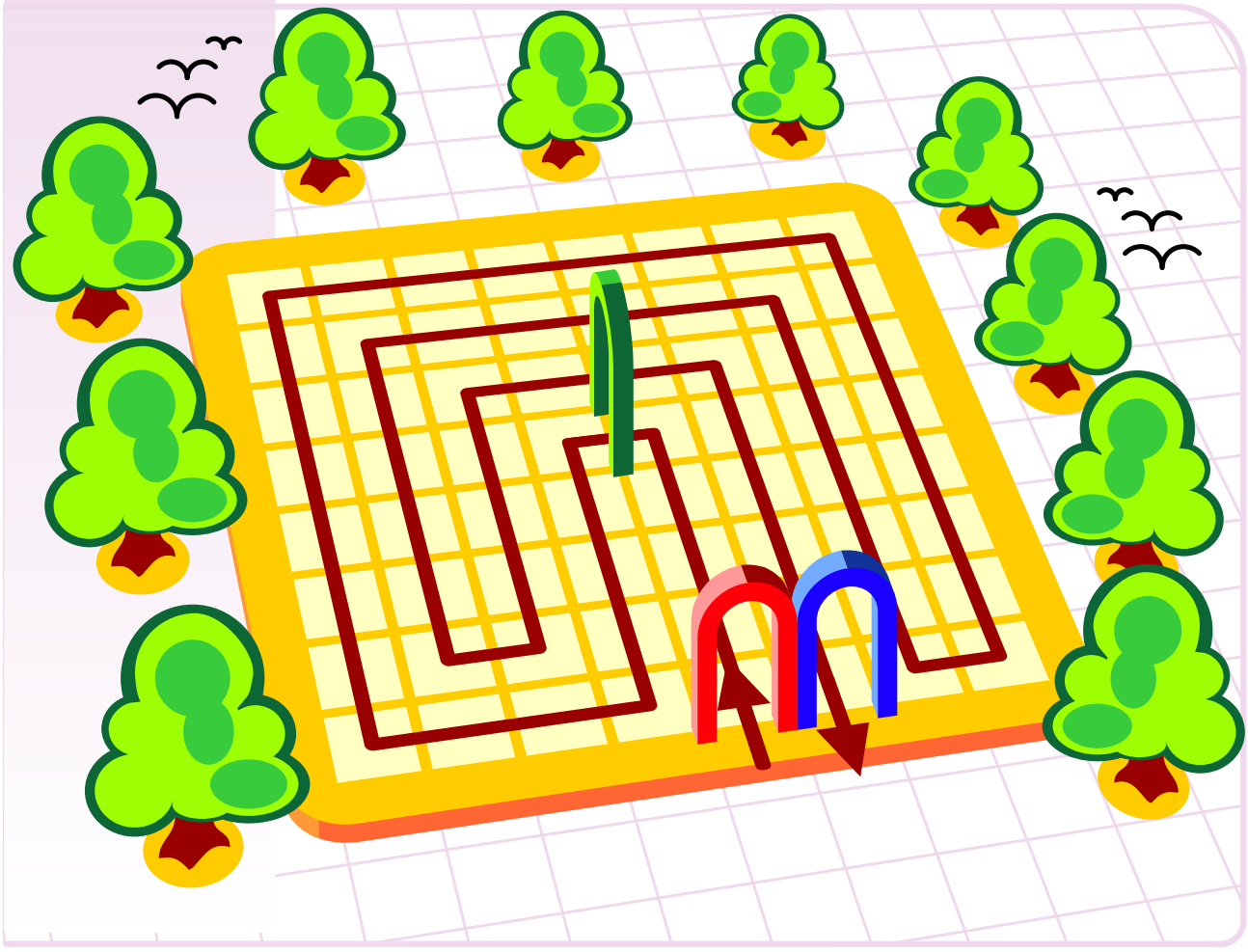
One of the solutions is given below. The first number in each pair indicates the initial cell of the move and the second - the finish one of the same move. 7-6, 2-7, 9-2, 4-9, 3-4, 8-3, 1-8.

Historical information by professor David Singmaster, England, shows how old this puzzle is. It appeared in the following manuscripts: King's Library MS.13, A, xviii, c.1275; Nicholas de St. Nicholai (attrib.): "Bonus Socius" - collection of chess problems, c.1275; at-Tilimsani, 1446.



Improvised Chessboard (solution)

The solution is shown in the illustration.



Puzzling Journey 2 (solution)

One of the solutions is shown in the illustration.

8/(3-8/3)=24

Twenty4 puzzle (solution)

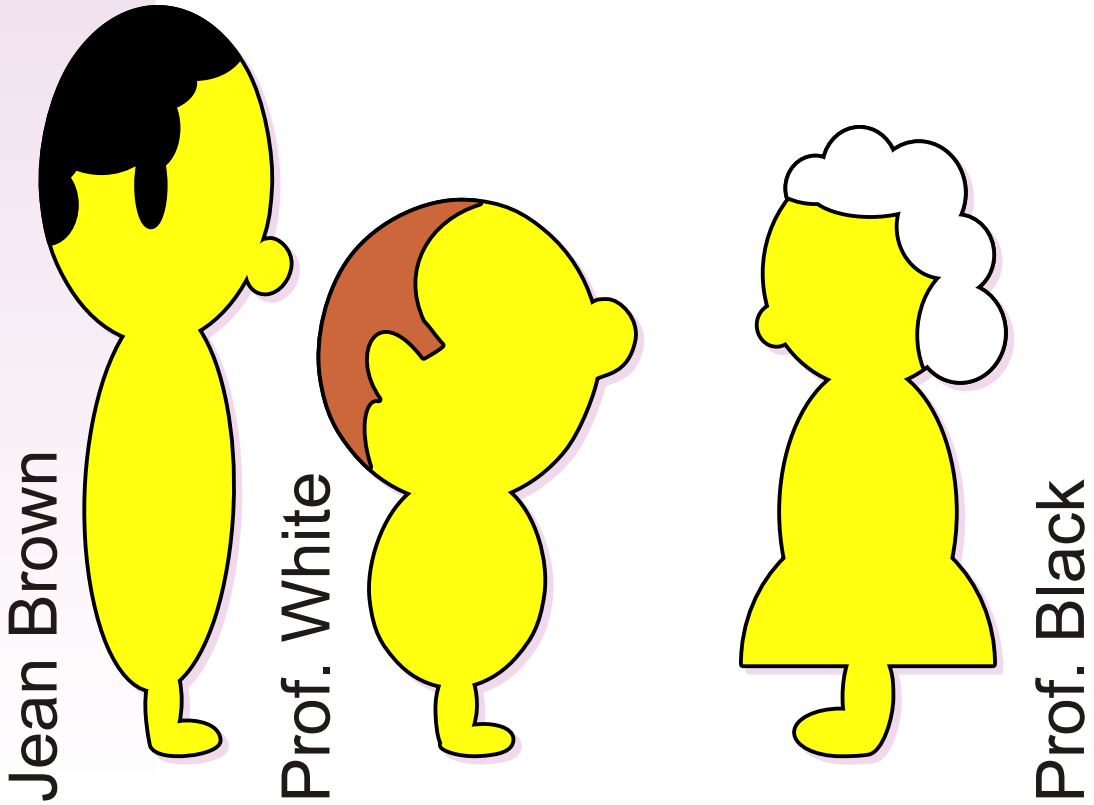
The solution is shown in the illustration.

The first operation within the brackets gives you exactly 1/3 because 3 could be written as 9/3, and 9/3 minus 8/3 equals exactly 1/3.

The second operation (8/ 1/3) could be written in another way as 8 x 3 (according to mathematical rules) which is exactly 24.

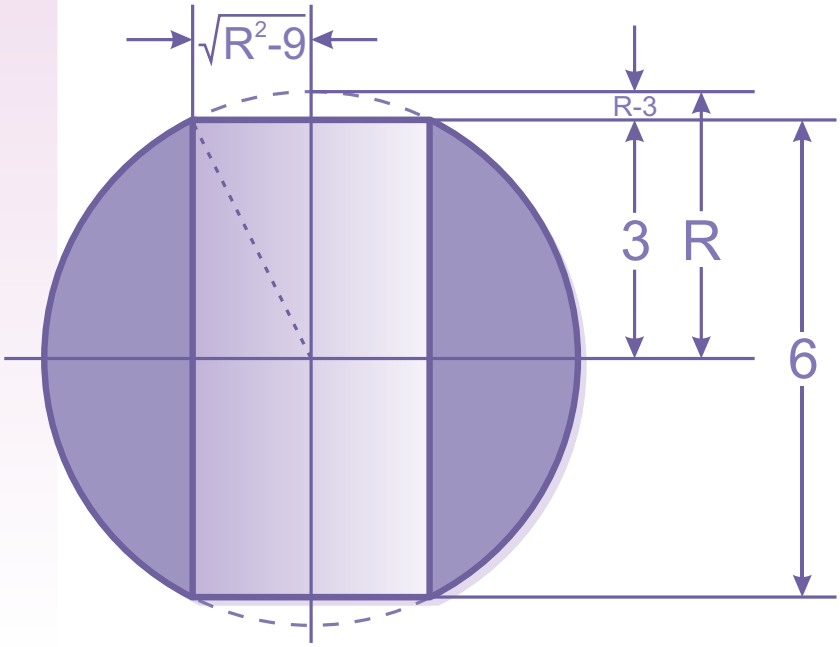
An Easy One (solution)

The solution is shown in the illustration.



Colored Names & Hair (solution)

From the conversation Professor White's hair can't be white (for then it would match his or her name), nor can it be black because he (or she) replies to the black-haired person. Therefore it must be brown. If the lady's hair isn't brown, then Professor White is not a lady. The remark from the black-haired person can't be from Professor Black (for then the color of hair would match his or her name) and can't be from Professor White as well (because the remark prompts an exclamation from White). Therefore the black-haired person is Jean Brown. Based on this the first statement from the lady is made by Professor Black. Her hair can't be black or brown, so she must be blonde.



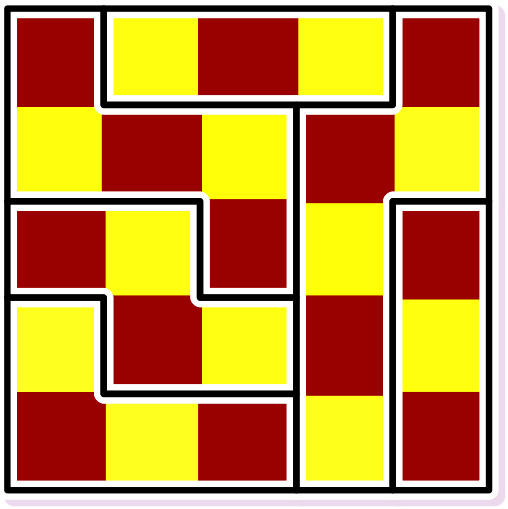
Hole in the Sphere (solution)

If you want to avoid the calculations in Solution 1, simply take a look directly at Solution 2 below it.

Solution 1. Let **R** be the radius of the sphere. As the illustration indicates, the radius of the cylindrical hole will then be the square root of $\mathbf{R^2 - 9}$, and the altitude of the spherical caps at each end of the cylinder will be **R - 3**. To determine the residue after the cylinder and caps have been removed, we add the volume of the cylinder, $\mathbf{6\pi(R^2 - 9)}$, to twice the volume of the spherical cap, and subtract the total from the volume of the sphere, $\mathbf{4\pi R^3/3}$. The volume of the cap is obtained by the following formula, in which **A** stands for its altitude and **r** for its radius: $\mathbf{\pi A(3r^2 + A^2)/6}$.

When this computation is made, all terms obligingly cancel out except $\mathbf{36\pi}$ - the volume of the residue in cubic inches. In other words, the residue is constant regardless of the hole's diameter or the size of the sphere!

Solution 2. John W. Campbell, Jr., editor of *Astounding Science Fiction*, was one of several readers who solved the sphere problem quickly by reasoning adroitly as follows: The problem would not be given unless it has a unique solution. If it has a unique solution, the volume must be a constant which would hold even when the hole is reduced to zero radius. Therefore the residue must equal the volume of a sphere with a diameter of six inches, namely $\mathbf{36\pi}$.



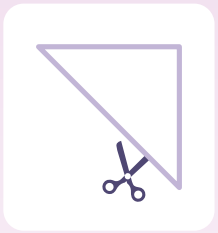
Broken Checkerboard (solution)

The solution is shown in the illustration.

Print 'n' Play Collection of 12

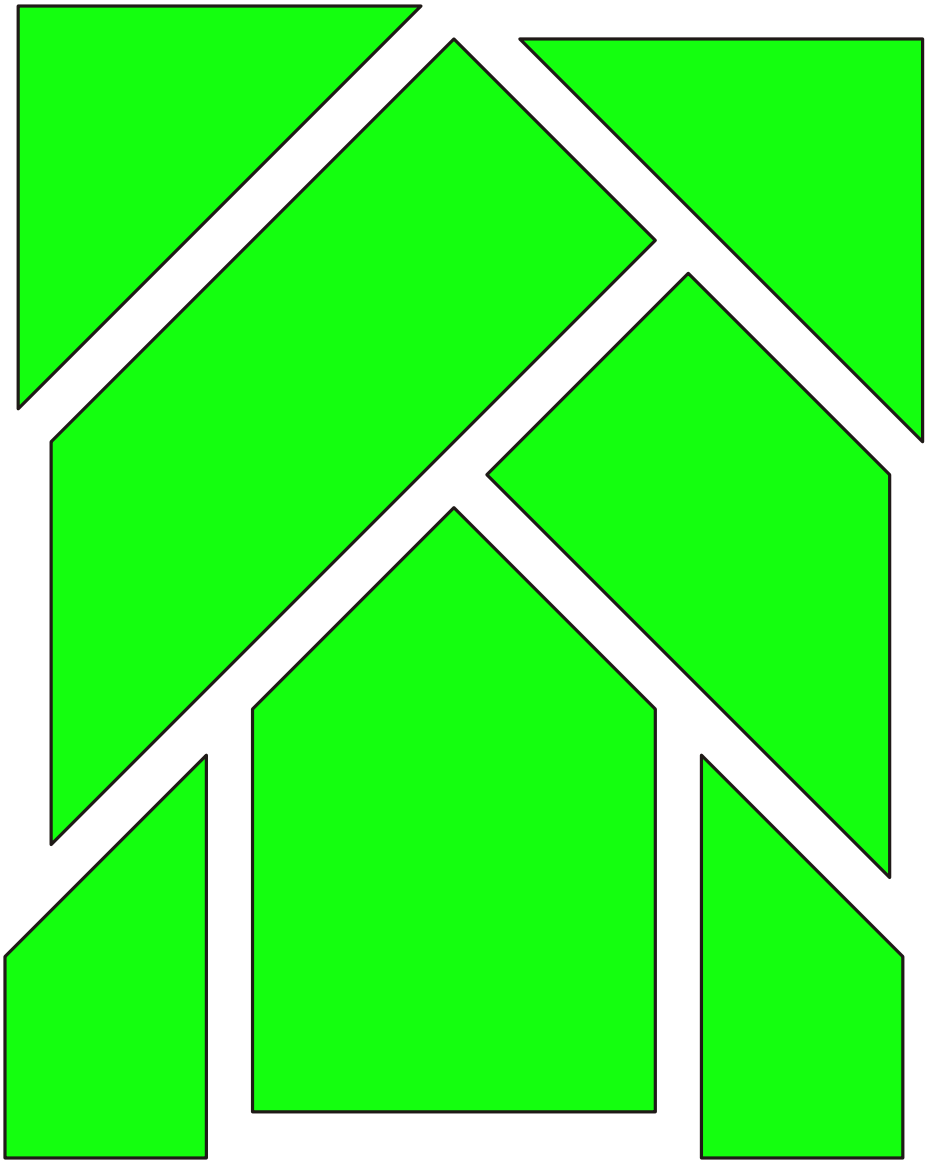
Pieces & Boards

1



x 7

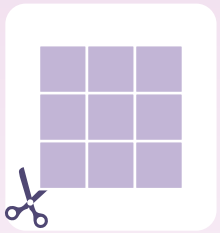
F



The Cross Breaker (pieces)

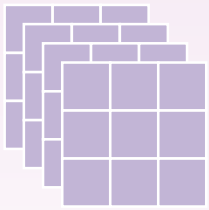
To produce the pieces first print them out. Then follow the diagram shown in the left column above - from step 1 to step F (finish).

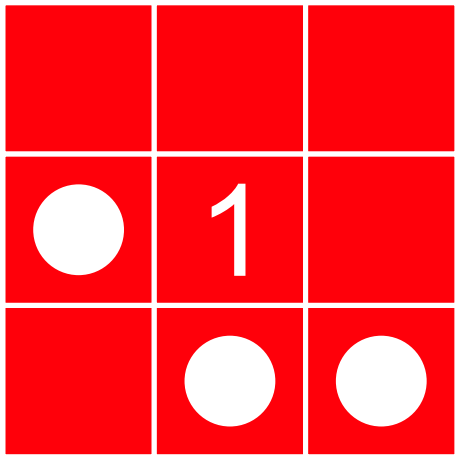
1

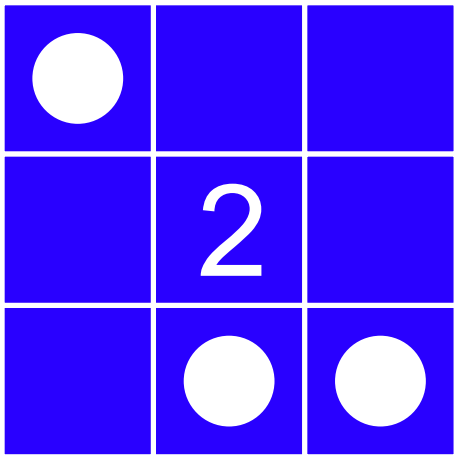


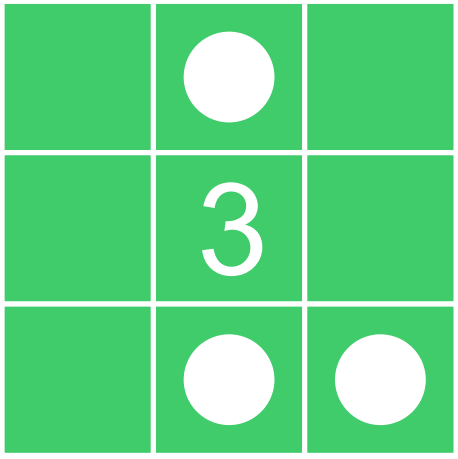
x 4

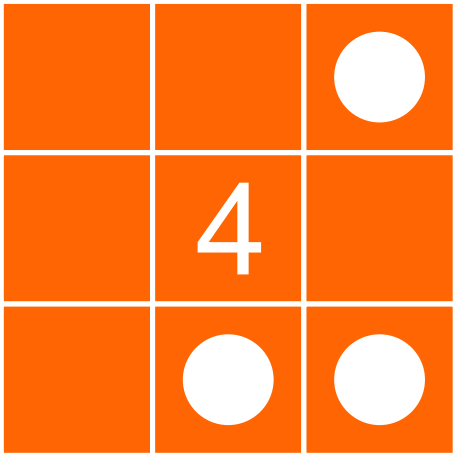
F









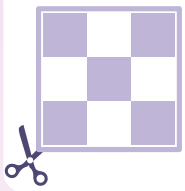


Squares 4 Four (pieces)

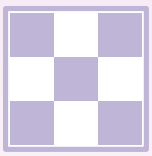
To produce the pieces first print them out. Then follow the diagram shown in the left column above - from step 1 to step F (finish).

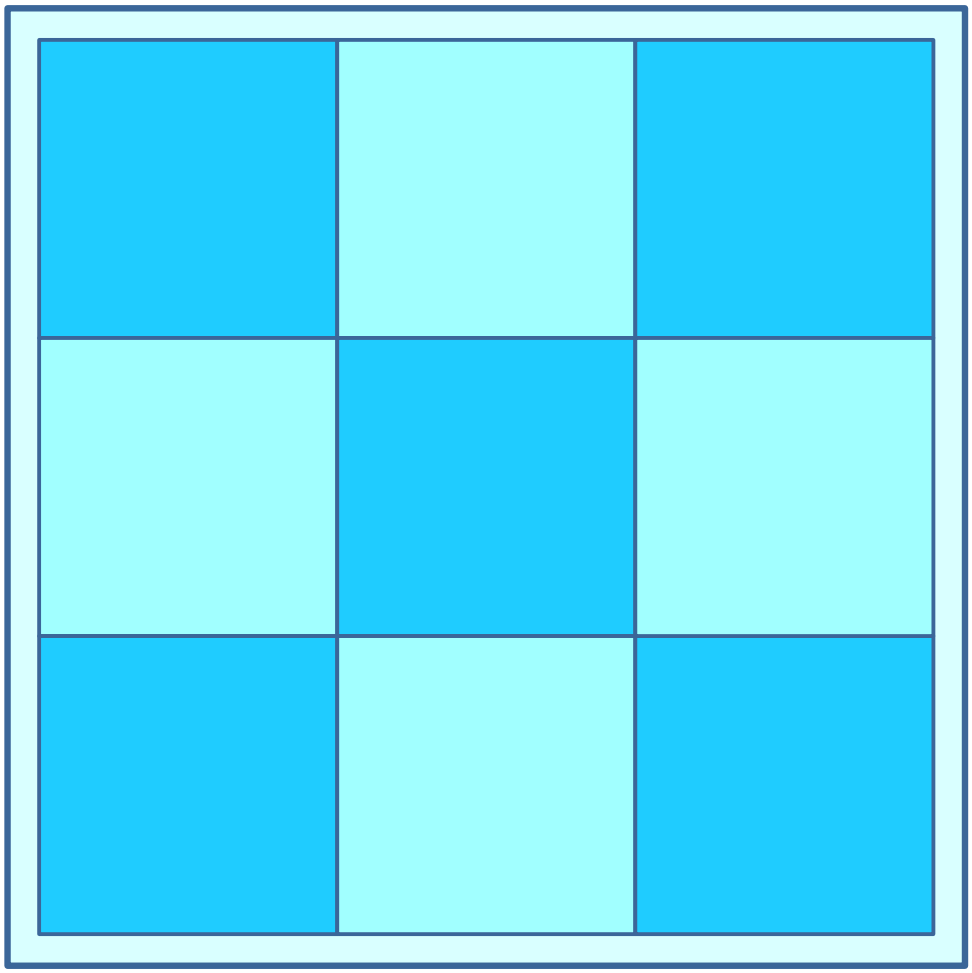
January 3, 2004 www.puzzles.com

1



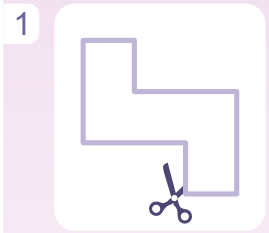
F



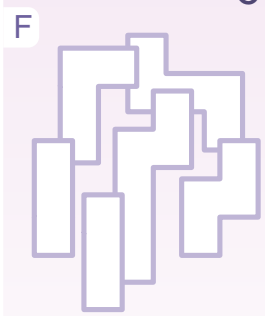


The 7 Knights Problem (board)

To produce the board first print it out. Then follow the diagram shown in the left column above - from step 1 to step F (finish).



x 6



Broken Checkerboard (pieces)

To produce the pieces first print them out. Then follow the diagram shown in the left column above - from step 1 to step F (finish).