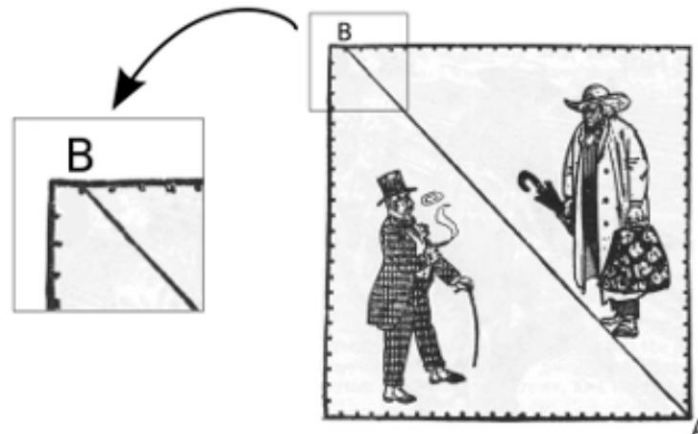## Épreuve de section européenne

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The Gold Brick Puzzle
What happens to the missing square inch?

This puzzle shows how easily a person can be deceived when they are buying a gold brick. The large square in the illustration represents the gold brick the farmer has just purchased from the top-hatted stranger. Its sides are divided into 24 parts evenly.

If the square is 24 inches on the side, then it must contain 24 times 24, or 576 square inches. Note the diagonal line from corner to corner. We cut the square on this line, then move the top piece up one space along the incline. If we cut off the small triangular piece at A, which will be projecting from the right side, we can replace it in the triangular space at B in the upper left corner.

We have now formed a rectangle that is 23 inches wide and 25 inches high. But 23 times 25 is only 575 square inches! What happened to that missing square inch?

From *Mathematical Puzzles* by Sam Loyd, edited by Martin Gardner

Questions

1. Looking at the picture, explain why the sentence *"Note the diagonal line from corner to corner"* is actually false and deliberately placed here to trick the reader.

2. Give a thorough step-by-step explanation of what needs to be done to transform the square into a 23 by 25 inches rectangle. Feel free to use a pair of scissors and one of the diagrams included on page 2.

3. Deduce from your answer to question 2 that the square and the rectangle have to share the same area.

4. Formulate with your own words the apparent paradox in this enigma.

5. Find and explain the flaws in the text (hint: according to the previous question, the dimensions of the rectangle cannot be correct).