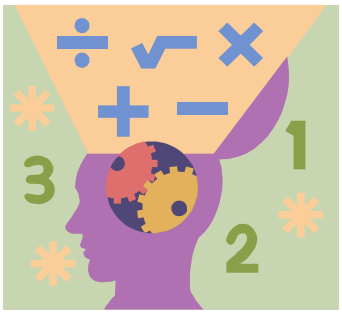
Algebra/Geometry Institute Summer 2010



Faculty Name: Diana Sanders

School: John F. Kennedy High School

Grade Level: 5th

Using Square (Color) Tiles to Investigate Numbers

1 Teaching objective(s):

- Students will model and distinguish between prime and composite numbers. (Institute's Objective)
- ***MS 1d. Model and distinguish between prime and composite numbers. (DOK 1)***

2 Instructional Activities:

- **Introduction:**
- Teacher will tell students that they will investigate some unique relationships between numbers.
- Teacher will place students into groups of two's (2's).
- Teacher will give each group grid paper and bag of square tiles.
- Have students to form rectangles using 4 squares and sketch the rectangles on a sheet of paper.

- **Activity:**
- Teacher will begin the activity with the numbers 12 and 16.
- Students will use the square tiles to make as many different rectangles as possible for each number. [Students will use square tiles to make rectangles by using the dimensions (length and width).]
- After groups have completed the task, have them to share answers and/or findings. (Findings: each number formed more than 1 rectangle.)
- Teacher will asked questions to check for students understanding such as; what were the dimensions for 12? 16? How many rectangles were formed by the number 12? 16? (Point out that a 1 by 12 and 12 by 1 are considered to be the same because of the commutative property of multiplication.)

- **Activity:**
- Teacher will give a range of numbers from 1 to 25 and assign groups different numbers to work with.
- Students will use the square tiles to form as many rectangles as possible for their assigned numbers.
- Students will draw and label models of each rectangle on the grid paper while looking for patterns. (The use of coloring crayons at this point is optional.)

- **Closure:**
- After groups have completed the task, have them to discuss patterns and/or findings.
  1. **Findings/Patterns**: some numbers will have more than one rectangle, some numbers will have only one rectangle, and the number one will display a unique rectangle.
- Teacher will asked students what the squares and rectangles represented. (Squares represented factors and rectangles represented the product of the factors.)
- Teacher will asked probing questions to guide students to the concept of rectangular dimensions to develop the definitions of prime and composite numbers.

  Possible Questions:
  1. Did you find more than one rectangle for all the numbers?
  2. Which numbers formed only one rectangle?
  3. What did you noticed about the dimensions of these rectangles?
  4. Which numbers formed more than one rectangle? Why?

  Findings:
  1. The dimensions of each rectangle are the factors for that number.
  2. The total number of squares in the rectangle represents the product.
  3. The prime numbers have only one rectangle.
  4. The numbers that are composite have more than one rectangle.
- Teacher will display grid models throughout the classroom.

3 Materials and Resources:

Materials:
Teacher created worksheet
Square (color) tiles
Pencil
Coloring crayons (optional)

Resources:
Walle, John A. Van de, Elementary and Middle School Mathematics, Wesley Longhorn, Inc., 1998, Third Edition, pp. 436-437.

4 Assessment

Teacher will use observation, modeling of rectangles, oral responses, and completion of grid models

Name_____ Date_____ Class Hour_____

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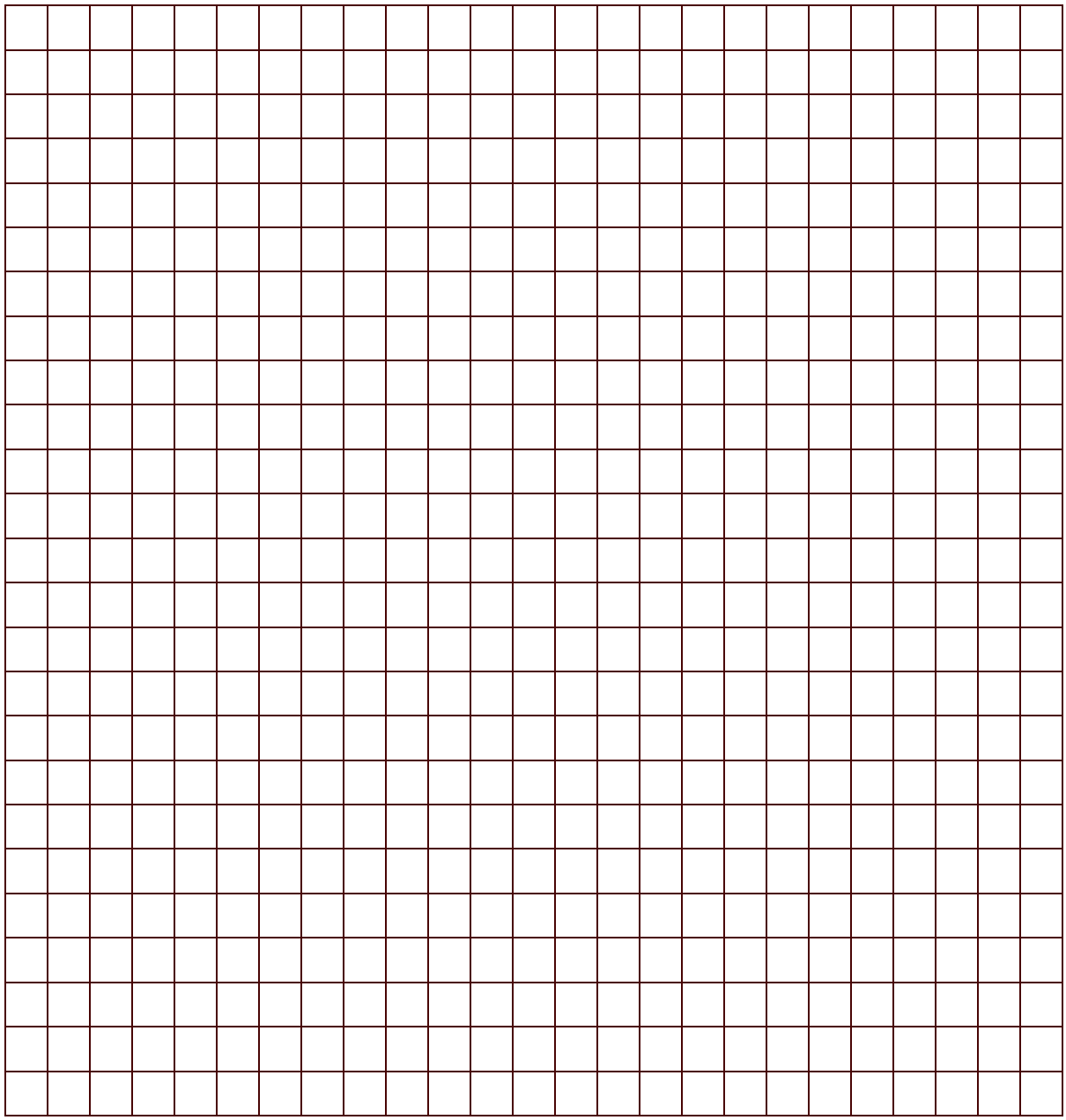

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Answer Key

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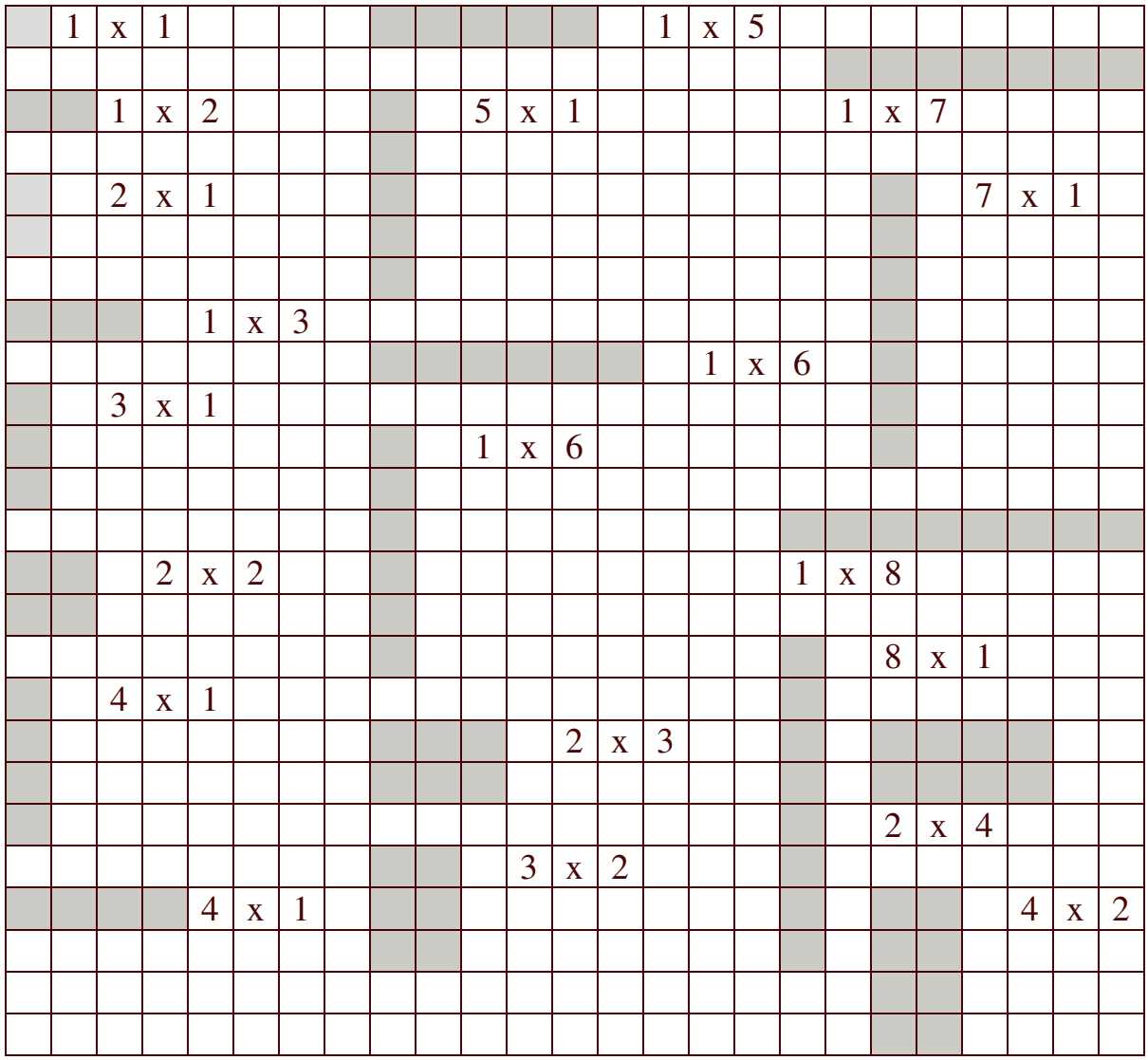

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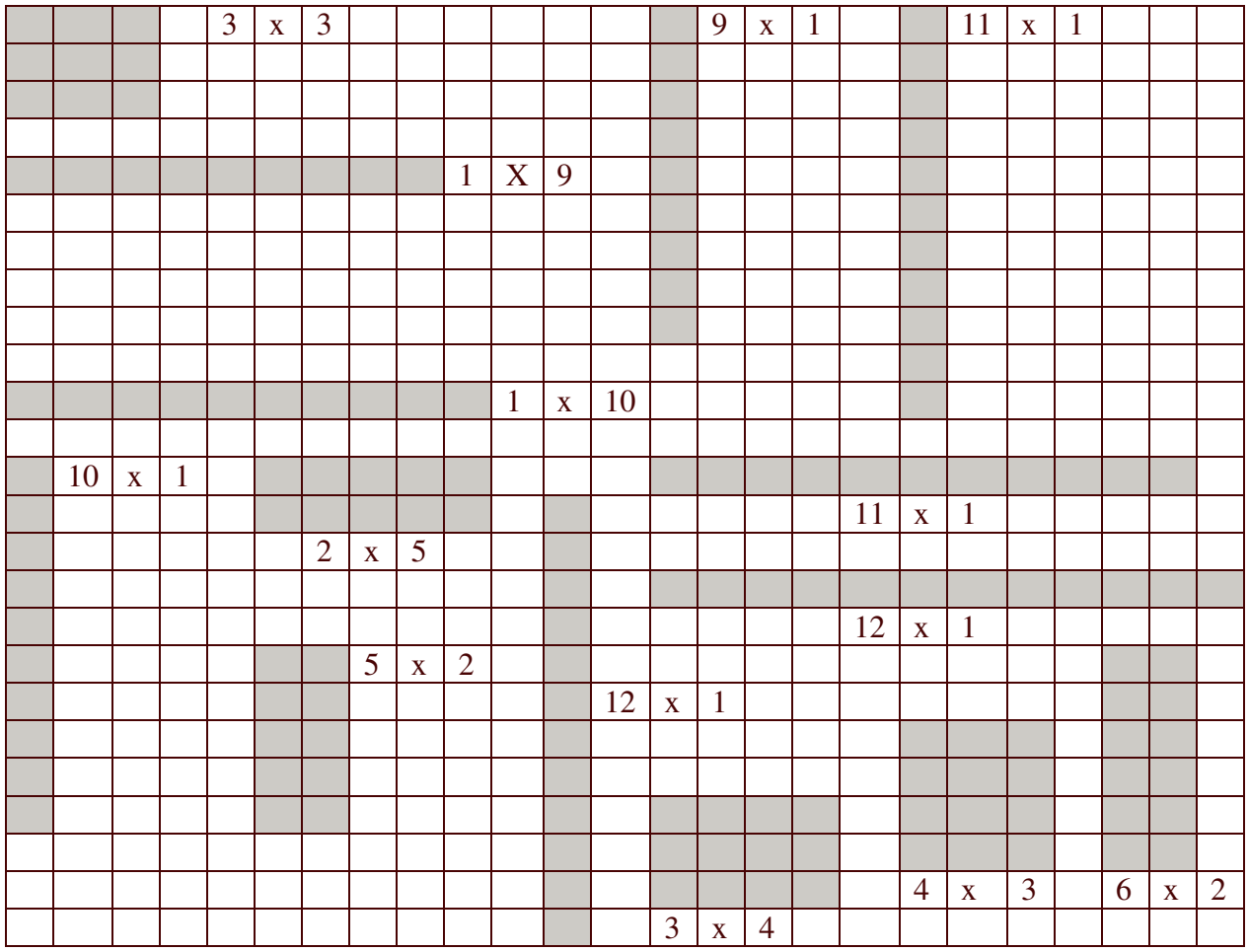

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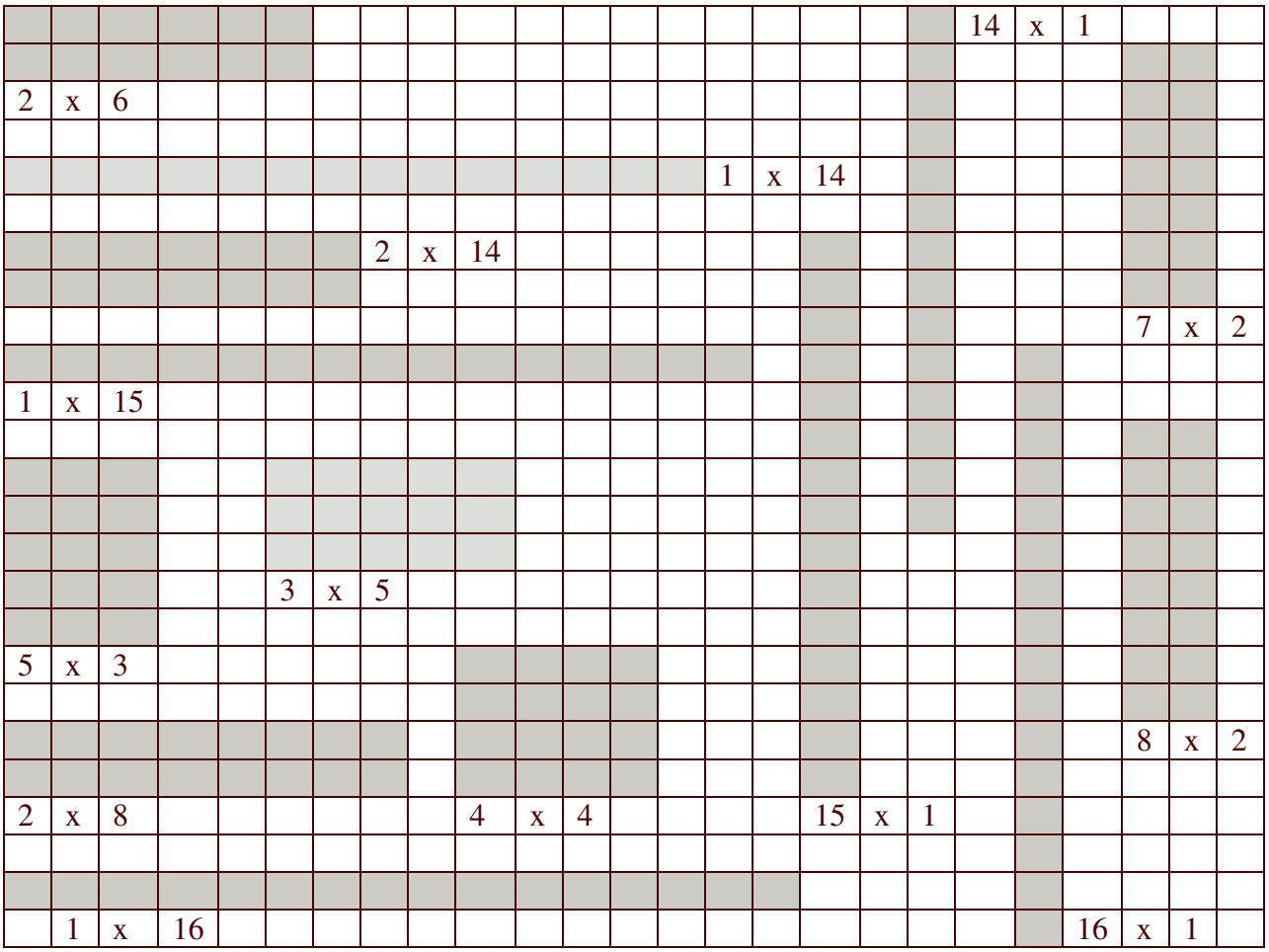

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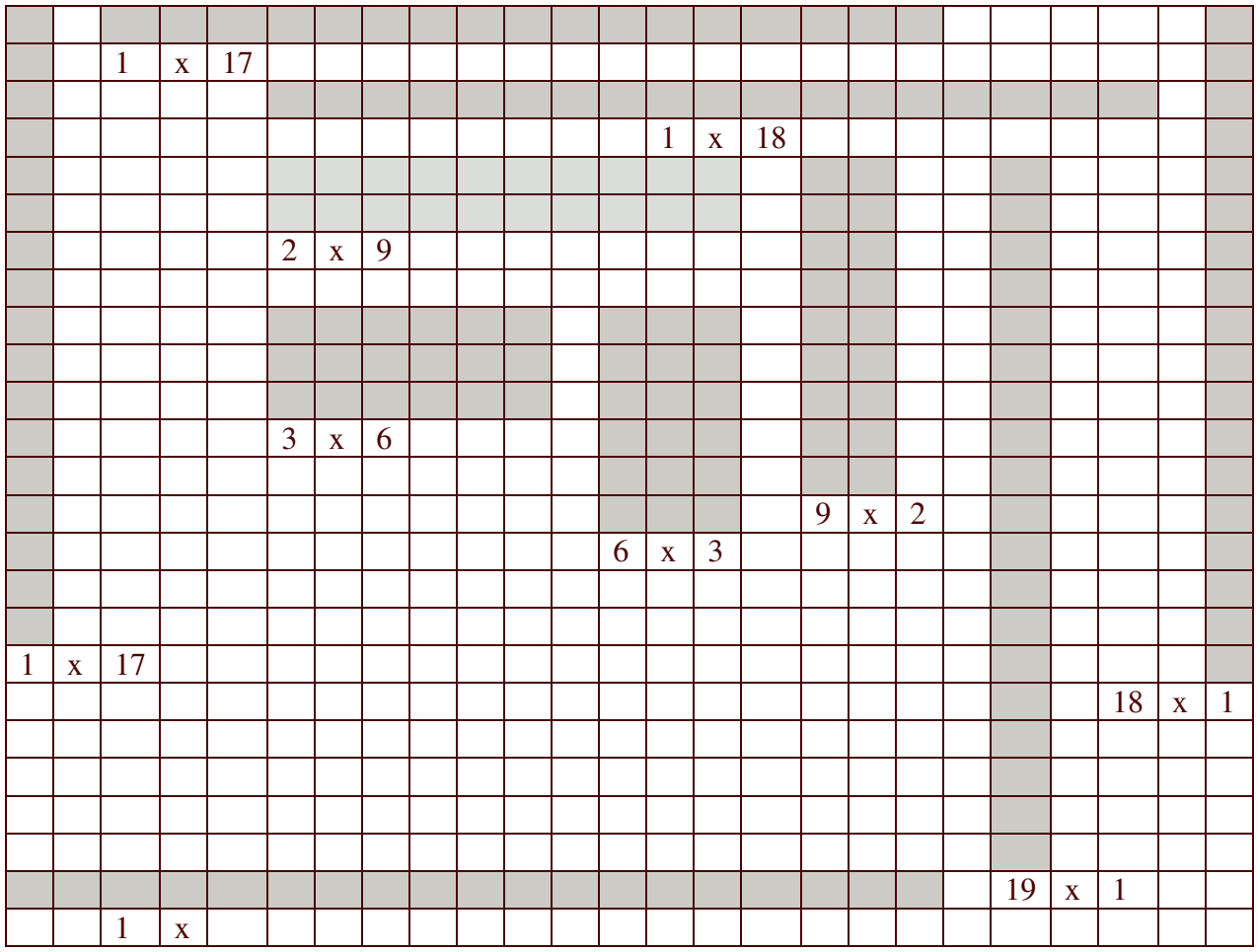

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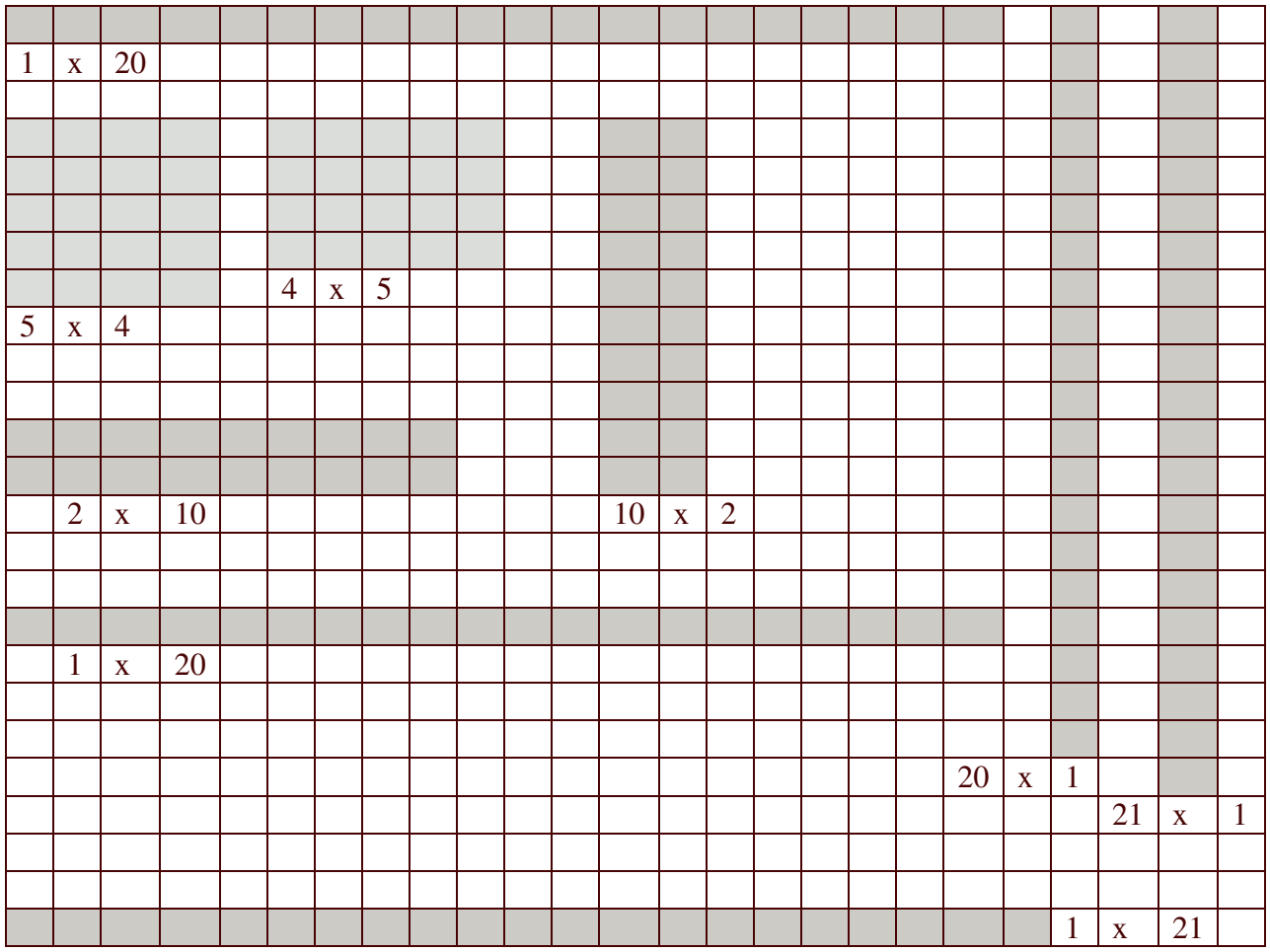

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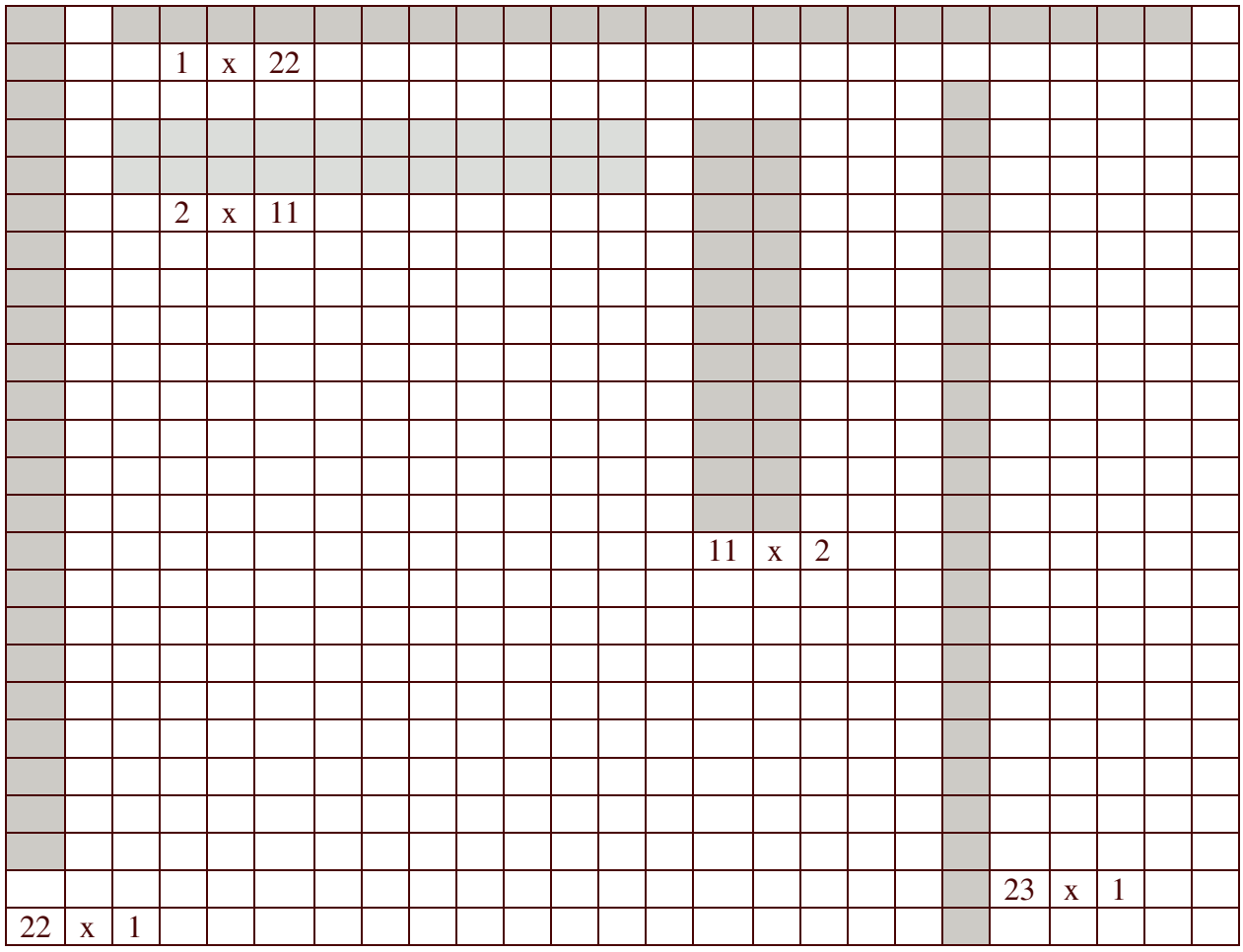

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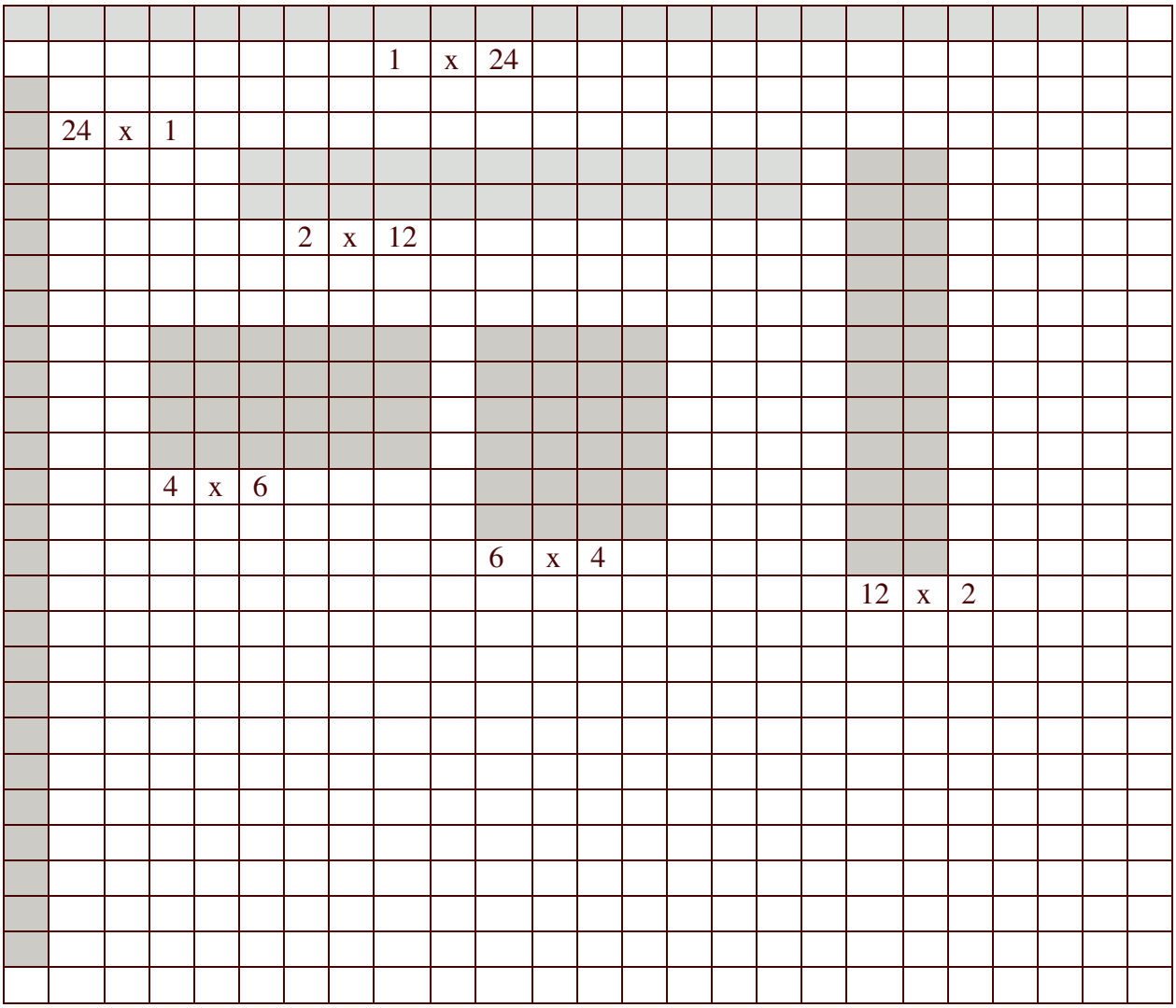

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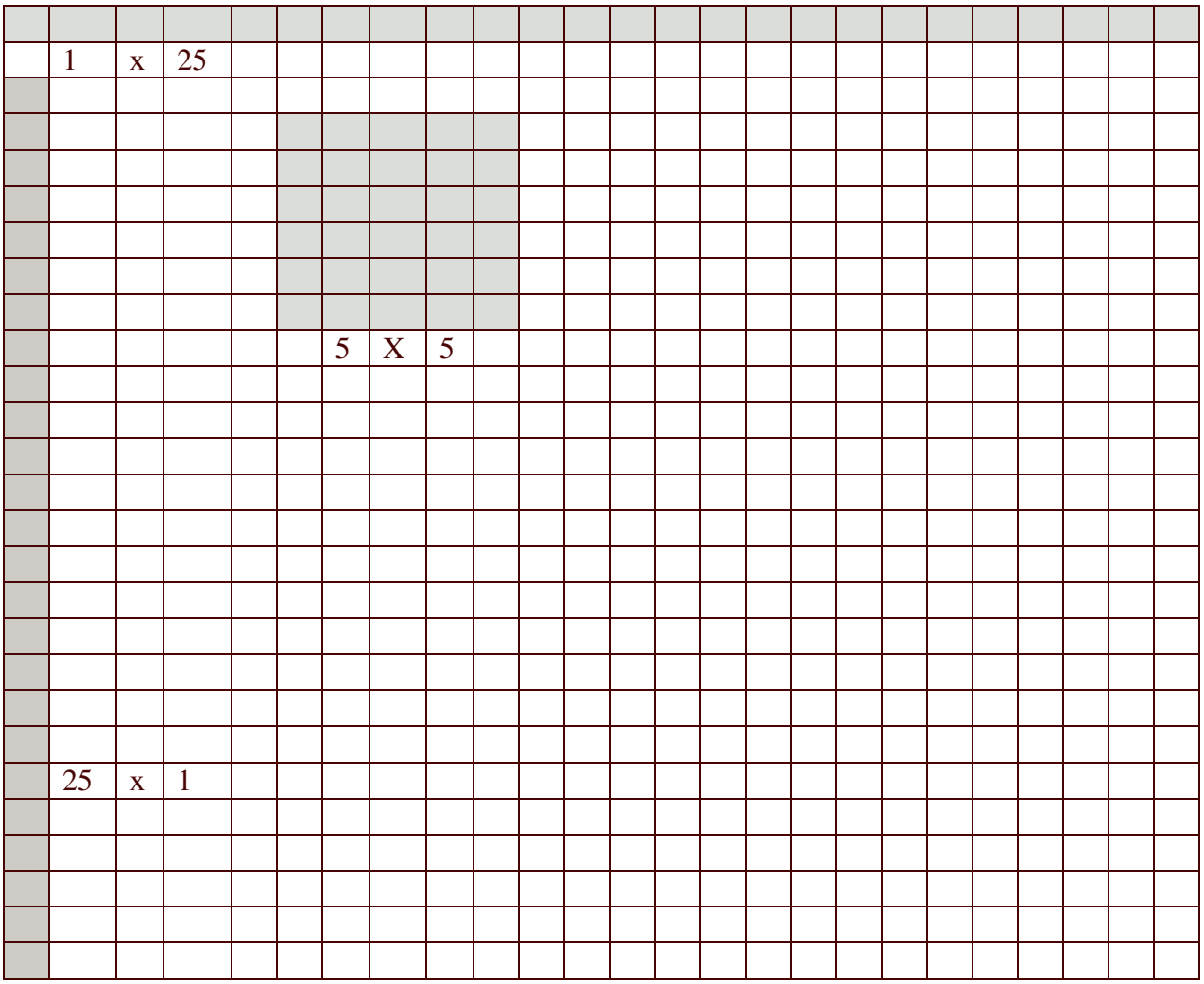
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