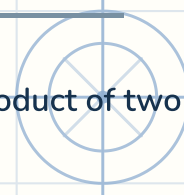


Counting rectangles — Grids up to 12 dots

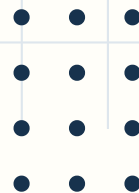
Name: _____

Date: _____



Count the rectangles you can make from a grid of dots, and show why it is a product of two combinations.

- 1 A pegboard holds its pegs in a rectangle 3 pegs across and 4 pegs down — 12 pegs altogether. A rectangle is any four pegs that make its corners, sides along the rows and columns.



How many rectangles are there?

Why

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- 2 A park has lamp posts in a grid 2 across and 6 deep, 12 lamps in all. A rectangle has four lamps as corners with its sides running along the rows and columns.



How many rectangles are there?

Why

.....

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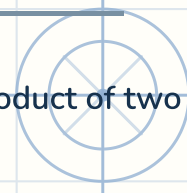


Counting rectangles — Grids up to 12 dots

Name: _____

Date: _____

Count the rectangles you can make from a grid of dots, and show why it is a product of two combinations.



- 3 A park has lamp posts in a grid 2 across and 3 deep, 6 lamps in all. A rectangle has four lamps as corners with its sides running along the rows and columns.



How many rectangles are there?

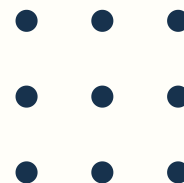
Why

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- 4 A pegboard holds its pegs in a rectangle 3 pegs across and 3 pegs down — 9 pegs altogether. A rectangle is any four pegs that make its corners, sides along the rows and columns.



How many rectangles are there?

Why

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Counting rectangles · Grids up to 12 dots — Answer key

If they are stuck

- A rectangle is two columns and two rows. Count the ways to choose each, and multiply — do not just count the little cells.



1. A rectangle with sides on the grid is pinned down by 2 of the 3 columns — its left and right edges — and 2 of the 4 rows — its top and bottom. The columns give $C(3,2) = 3$, the rows give $C(4,2) = 6$, and every pair of columns goes with every pair of rows: $3 \times 6 = 18$. So 18 rectangles, not the 6 little cells you get by counting only the smallest squares.

3. A rectangle with sides on the grid is pinned down by 2 of the 2 columns — its left and right edges — and 2 of the 3 rows — its top and bottom. The columns give $C(2,2) = 1$, the rows give $C(3,2) = 3$, and every pair of columns goes with every pair of rows: $1 \times 3 = 3$. So 3 rectangles, not the 2 little cells you get by counting only the smallest squares.

2. A rectangle with sides on the grid is pinned down by 2 of the 2 columns — its left and right edges — and 2 of the 6 rows — its top and bottom. The columns give $C(2,2) = 1$, the rows give $C(6,2) = 15$, and every pair of columns goes with every pair of rows: $1 \times 15 = 15$. So 15 rectangles, not the 5 little cells you get by counting only the smallest squares.

4. A rectangle with sides on the grid is pinned down by 2 of the 3 columns — its left and right edges — and 2 of the 3 rows — its top and bottom. The columns give $C(3,2) = 3$, the rows give $C(3,2) = 3$, and every pair of columns goes with every pair of rows: $3 \times 3 = 9$. So 9 rectangles, not the 4 little cells you get by counting only the smallest squares.