Tiling and the Distributive Property

Apply the skill to decisions and designs

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

A vertical split leaves the height unchanged. A horizontal split leaves the width unchanged. Multiply the shared side length by each part of the split side, then add the areas. Do not count any square twice.

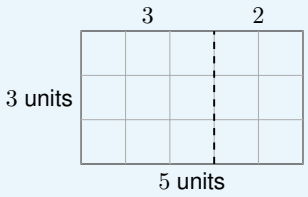
Worked example

Use the split to find two smaller areas. Then write the distributive equation for the whole rectangle.

1. The left part has area $3 \times 3 = 9$; the right part has area $3 \times 2 = 6$.

2. Add the nonoverlapping parts: $9 + 6 = 15$, equal to 3×5.

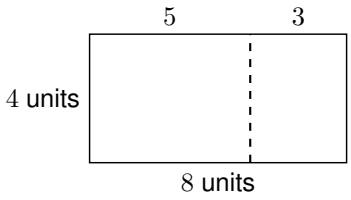
Answer: $3 \times (3 + 2) = 9 + 6 = 15$ square units.



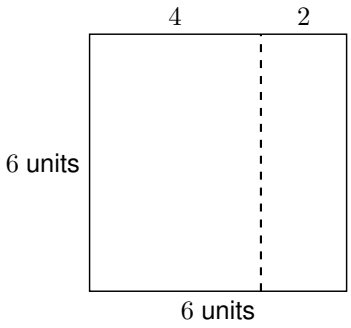
Practice Problems

Show your thinking.

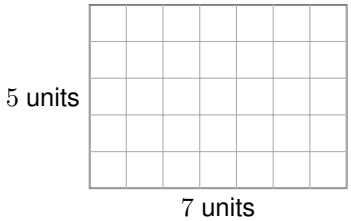
1. The left part will be red and the right part blue. Find the area of each color and the area to paint altogether.



2. A gardener covers the left part first and has material for 35 square units in all. Is that enough to cover both parts?

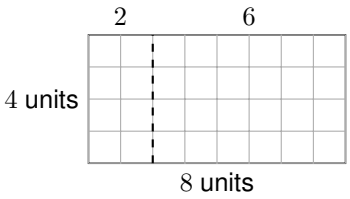


3. Draw a vertical divider 2 units from the left edge. Find the right width and write the two areas as a sum.



4. A 3-row mosaic has 24 tiles. It is divided into two full-height colors. The blue part has 9 tiles. How many columns of each color are there?

5. A 4-row planting bed has a herb section 2 units wide and a flower section 6 units wide. Move the divider so the herb area doubles. Find the new flower area and check the total stays the same.



6. A 5-row banner must cover 35 square units. Each of its two full-height colors must use at least 2 columns. Give two different splits, not counting the same split with colors swapped. Write the two area sums.

Answer Key

1. Red 20; blue 12; total 32 square units.
2. No; short by 1 square unit.
3. Right width 5 units; $10 + 25 = 35$ square units.
4. Blue: 3 columns. Other color: 5 columns.
5. Flower area: 16 square units. Total: 32 square units.
6. Widths 2 and 5: $10 + 25 = 35$. Widths 3 and 4: $15 + 20 = 35$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Red area: $4 \times 5 = 20$. Blue area: $4 \times 3 = 12$.

2. The parts share an edge but not any surface, so the total is $20 + 12 = 32$ square units.

Problem 2

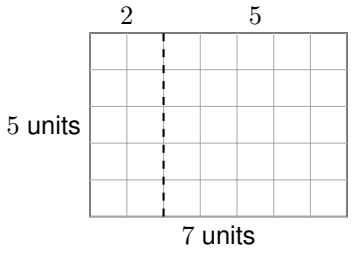
1. The two parts need $6 \times 4 + 6 \times 2 = 24 + 12 = 36$ square units.

2. Available coverage is 35, so the shortage is $36 - 35 = 1$ square unit.

Problem 3

1. Count 2 columns from the left and draw down that grid line. The right width is $7 - 2 = 5$ units.

2. The areas are $5 \times 2 = 10$ and $5 \times 5 = 25$; total $10 + 25 = 35$ square units.



Problem 4

1. Every column has 3 tiles, so blue takes $9 \div 3 = 3$ columns.

2. The other color has $24 - 9 = 15$ tiles, or $15 \div 3 = 5$ columns. Check $3(3 + 5) = 24$.

Problem 5

1. Herbs start at $4 \times 2 = 8$ square units. Doubling gives 16, so herbs now need $16 \div 4 = 4$ columns.

2. Width stays $2 + 6 = 8$. Flowers now use $8 - 4 = 4$ columns, giving $4 \times 4 = 16$. Check $16 + 16 = 32$, the original 4×8.

Problem 6

1. The whole banner needs width $35 \div 5 = 7$. Each split must use two widths of at least 2.

2. Try $2 + 5 = 7$ and $3 + 4 = 7$. The matching products are $5 \times 2 + 5 \times 5 = 35$ and $5 \times 3 + 5 \times 4 = 35$.

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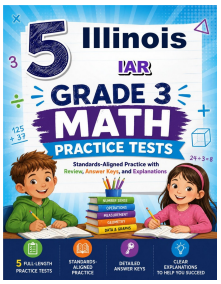

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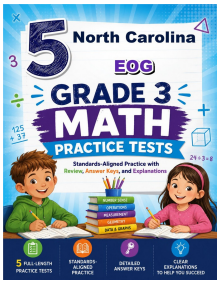

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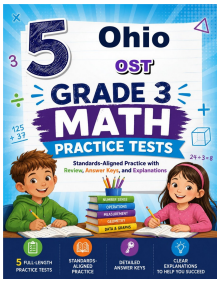

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