Tiling and the Distributive Property

Spot mistakes, reason, and work backward

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.

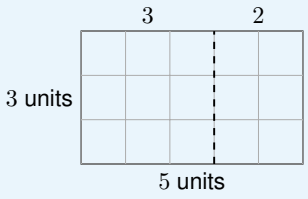
Worked example

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.

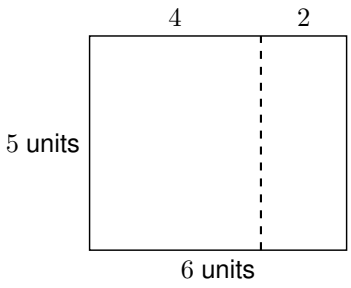
Answer: $3 \times (3 + 2) = 9 + 6 = 15$ square units.



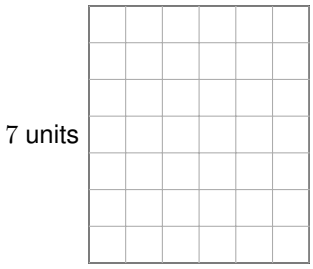
Practice Problems

Show your thinking.

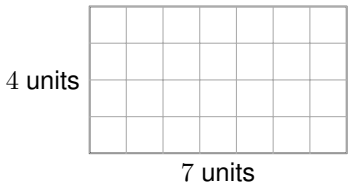
1. A student writes $5 \times (4 + 2) = 5 \times 4 + 2 = 22$. Repair the second part.



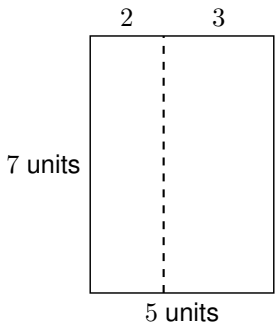
2. Draw a horizontal split after 3 rows in a rectangle 6 units wide and 7 units tall. Use both row blocks to find the area.



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

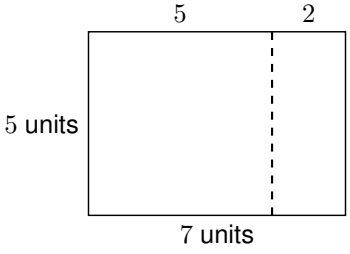


4. A student writes $7 \times (2 + 3) = 7 \times 2 + 3 = 17$. Repair the second part.



5. Two adjoining rectangles have areas 3×3 and 3×4 square units. Their common height is 3. Find the whole width and area, and sketch one rectangle showing the split.

6. A student adds the two heights of these side-by-side parts and uses $10 \times 7 = 70$. Explain why the height must not be doubled and find the area.



Answer Key

1. $5 \times 4 + 5 \times 2 = 30$.
2. $3 \times 6 + 4 \times 6 = 18 + 24 = 42$ square units.
3. Right width 4 units; $12 + 16 = 28$ square units.
4. $7 \times 2 + 7 \times 3 = 35$.
5. Width 7 units; area 21 square units.
6. Height 5 units; area 35 square units.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

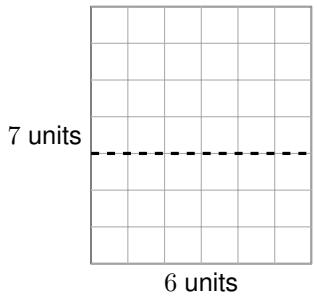
1. The right part has height 5 and width 2, so its area is $5 \times 2 = 10$, not 2.

2. Add the true areas: $20 + 10 = 30$ square units.

Problem 2

1. The lower block has 3 rows of 6: $3 \times 6 = 18$ squares.

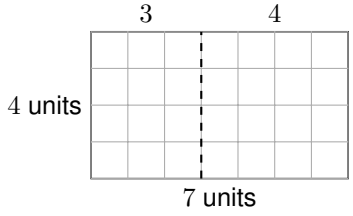
2. The remaining height is $7 - 3 = 4$; its area is $4 \times 6 = 24$. Add $18 + 24 = 42$.



Problem 3

1. Count 3 columns from the left and draw down that grid line. The right width is $7 - 3 = 4$ units.

2. The areas are $4 \times 3 = 12$ and $4 \times 4 = 16$; total $12 + 16 = 28$ square units.



Problem 4

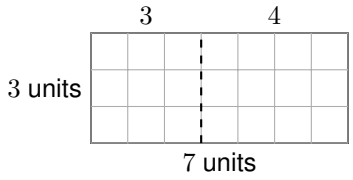
1. The right part has height 7 and width 3, so its area is $7 \times 3 = 21$, not 3.

2. Add the true areas: $14 + 21 = 35$ square units.

Problem 5

1. The side-by-side widths add: $3 + 4 = 7$ units; the shared height remains 3.

2. The area is $3 \times 7 = 21$, matching $3 \times 3 + 3 \times 4 = 9 + 12$.



Problem 6

1. Both parts run from the same bottom to the same top, so the whole height is 5, not $5 + 5 = 10$.

2. Add widths, not heights: $5 \times (5 + 2) = 25 + 10 = 35$ square units.

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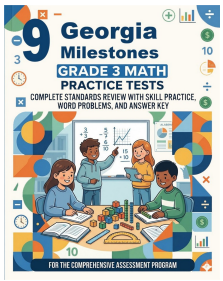

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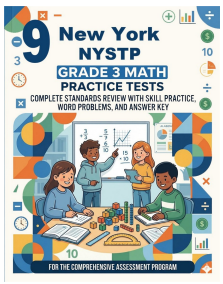

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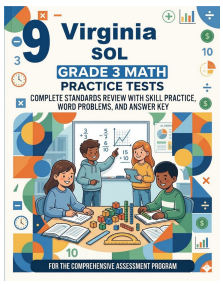

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