Partitioning Shapes into Equal Areas

Spot mistakes, reason, and work backward

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

QUICK REVIEW

Equal-area parts cover the same amount of surface, even if their shapes differ. Divide the total area by the number of equal parts. One of n equal parts covers $\frac{1}{n}$ of the whole. Unequal parts do not give equal shares.

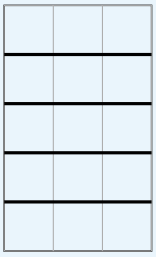
Worked example

The garden has five equal horizontal strips. How many unit squares are in one strip, and what fraction is it?

1. The 5 rows each contain 3 squares, for $5 \times 3 = 15$ in all.

2. One strip holds $15 \div 5 = 3$ squares. It is one of 5 equal parts, or $\frac{1}{5}$.

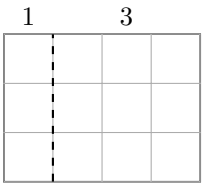
Answer: 3 square units; $\frac{1}{5}$ of the garden.



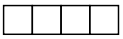
Practice Problems

Show your thinking.

1. A student calls both parts halves. Count squares in each part and decide if the partition is fair.

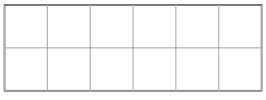


2. One part of a partition covers 4 square units and is $\frac{1}{3}$ of the whole. What is the whole area?

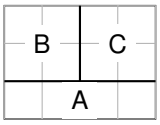


Each square: 1 sq unit

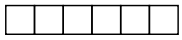
3. Use one vertical midline and one horizontal midline to make four equal-area parts. Name each fraction and count squares in one part.



4. A is a strip; B and C are squares. Are these three equal-area parts? Name each fraction of the whole.

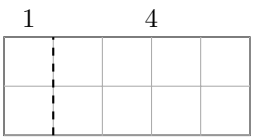


5. One part of a partition covers 6 square units and is $\frac{1}{4}$ of the whole. What is the whole area?



Each square: 1 sq unit

6. A student calls both parts halves. Count squares in each part and decide if the partition is fair.



Answer Key

1. Not halves; the two areas are unequal.
2. 12 square units.
3. Each is $\frac{1}{4}$; 3 squares.
4. Yes; each has area 4 square units and is $\frac{1}{3}$ of the whole.
5. 24 square units.
6. Not halves; the two areas are unequal.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The narrow part has $1 \times 3 = 3$ squares. The wider part has $3 \times 3 = 9$ squares.

2. Since $3 \neq 9$, the parts are not equal in area. Two pieces are halves only when their areas match.

Problem 2

1. The whole consists of 3 equal parts, each covering 4 square units.

2. Whole area $= 3 \times 4 = 12$ square units. Check: $12 \div 3 = 4$.

Problem 3

1. The whole has $6 \times 2 = 12$ squares. Midlines halve each side, making parts 3 by 1.

2. Each part has $3 \times 1 = 3$ squares, and four such parts cover 12 squares. Each is $\frac{1}{4}$.



Problem 4

1. A has $4 \times 1 = 4$ squares; B and C each have $2 \times 2 = 4$ squares.

2. The whole has $4 + 4 + 4 = 12$ squares. Each part covers $\frac{4}{12} = \frac{1}{3}$; equal area does not require the same shape.

Problem 5

1. The whole consists of 4 equal parts, each covering 6 square units.

2. Whole area $= 4 \times 6 = 24$ square units. Check: $24 \div 4 = 6$.

Problem 6

1. The narrow part has $1 \times 2 = 2$ squares. The wider part has $4 \times 2 = 8$ squares.

2. Since $2 \neq 8$, the parts are not equal in area. Two pieces are halves only when their areas match.

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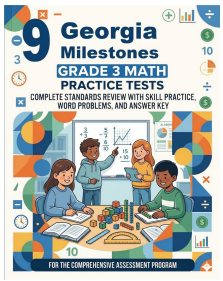

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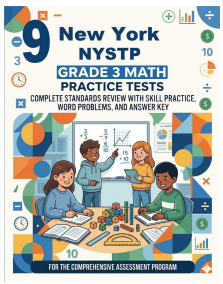

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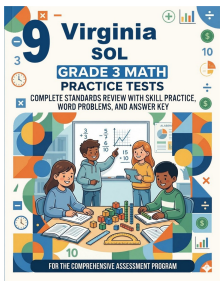

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