AREA

Tiling, Decomposing & Rearranging

Review for Math 6 • Unit 1 • Lessons 1–3

Goal: use area ideas flexibly — not just count squares.

***Access IDEAS** presents a customized session for **OUSD Math 6**.*

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What are we trying to understand?

Three ideas connect all of these lessons.

1

TILE

Cover a region with no gaps and no overlaps.

2

DECOMPOSE

Break a figure into pieces you understand.

3

REARRANGE

Move the pieces. The total area stays the same.

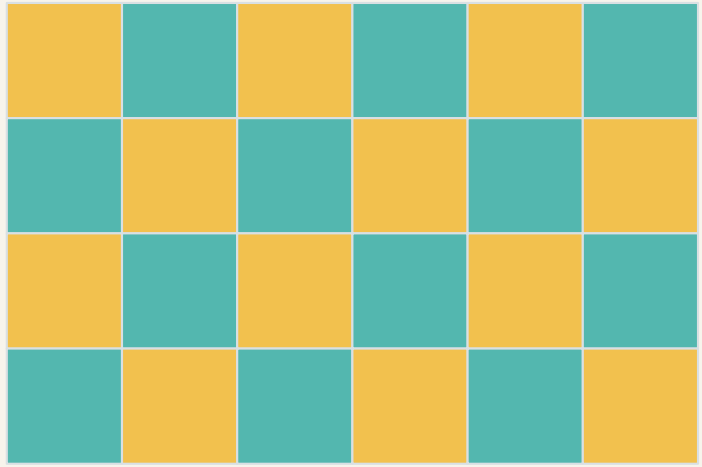
Big idea: Area measures how much two-dimensional space is covered, in square units.

Tiling means complete coverage

Every bit of the region is covered exactly once.

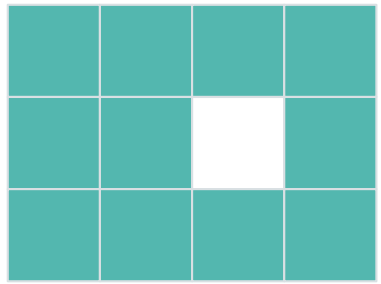
NO GAPS | **NO OVERLAPS** | **SQUARE UNITS**

A valid tiling

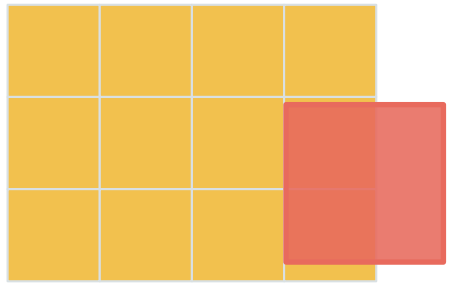


Every square-sized unit covers part of the region — nothing is missing, nothing is double-covered.

What goes wrong?



Gap → part of the region is uncovered



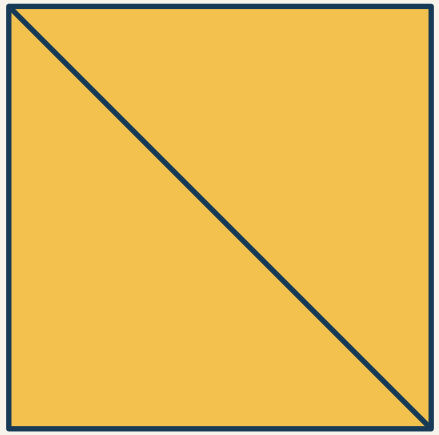
Overlap → some space gets counted twice

Pause & think: Why do equal-size square units make comparison fair?

Same pieces → same total area

Cutting and moving pieces changes the shape, not the amount of space.

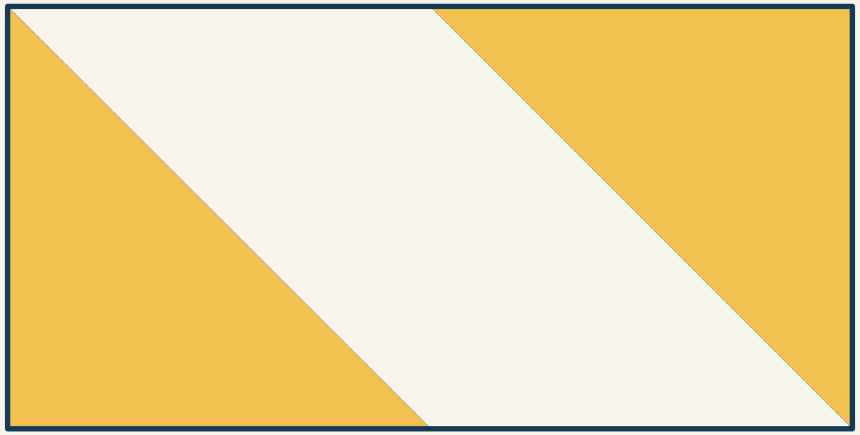
BEFORE



1 square unit

cut + move

AFTER

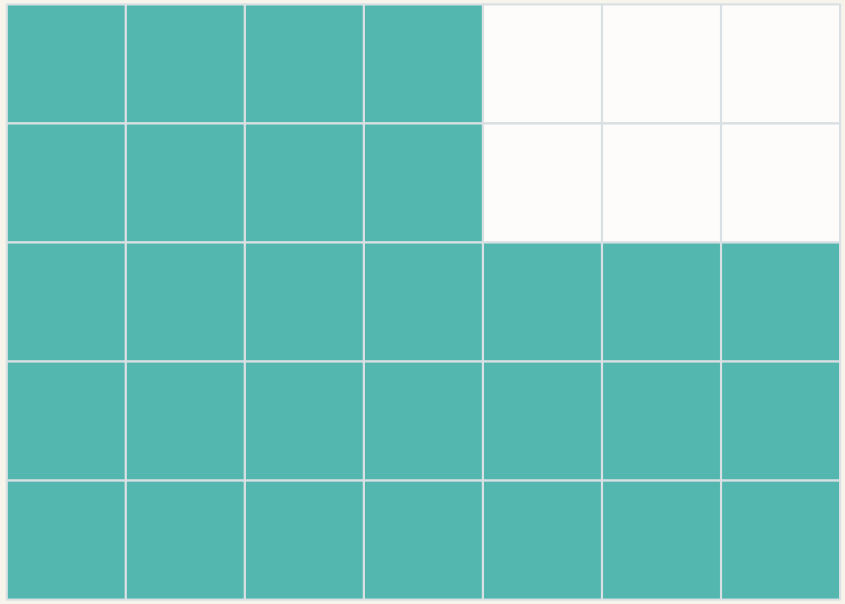


Still 1 square unit total

Area is additive: if pieces do not overlap, the area of the whole is the sum of the areas of its pieces.

Example 1 — Try it first

Find the area of this L-shaped region without counting every square.



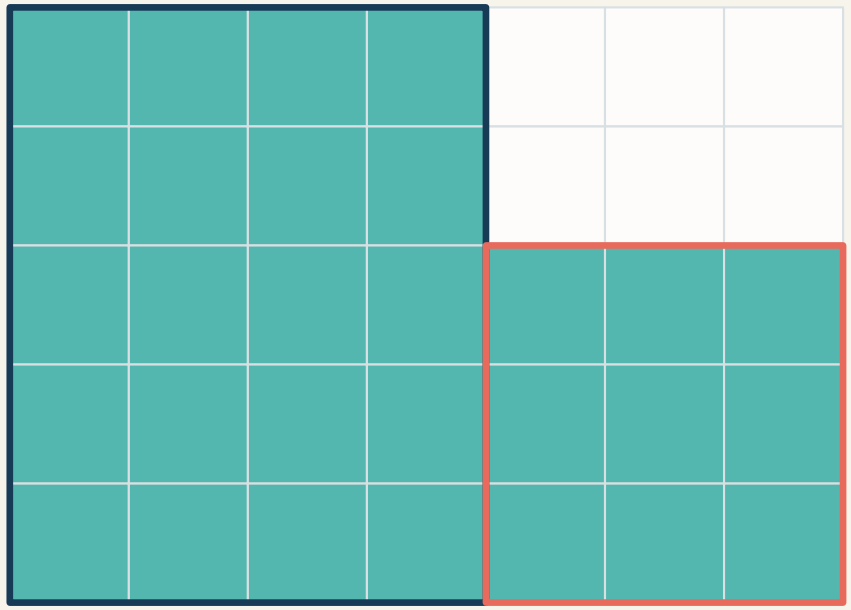
1

2

3

Example 1 — Step 1: Decompose

Find the area of this L-shaped region without counting every square.

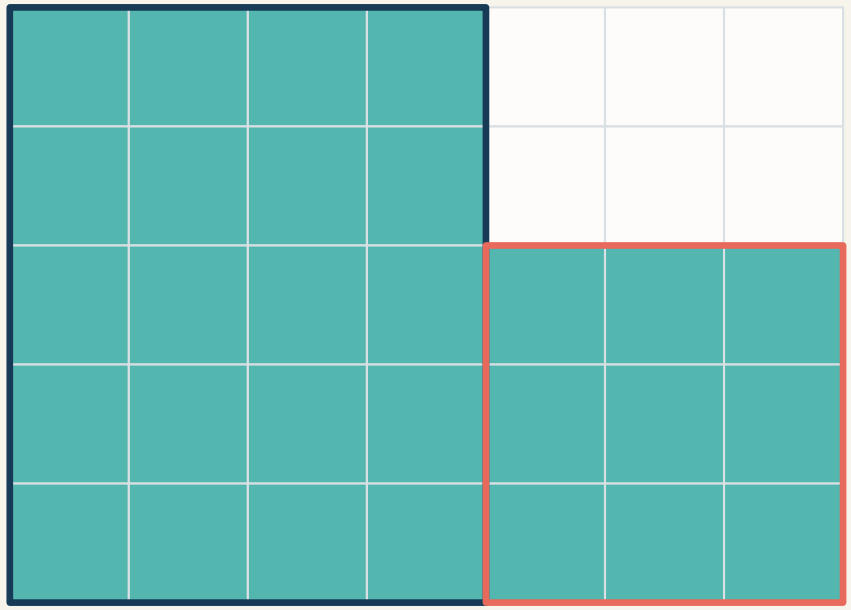


One way to decompose it:

1. Split the region into two rectangles.
2.
3.

Example 1 — Step 2: Find each area

Find the area of this L-shaped region without counting every square.



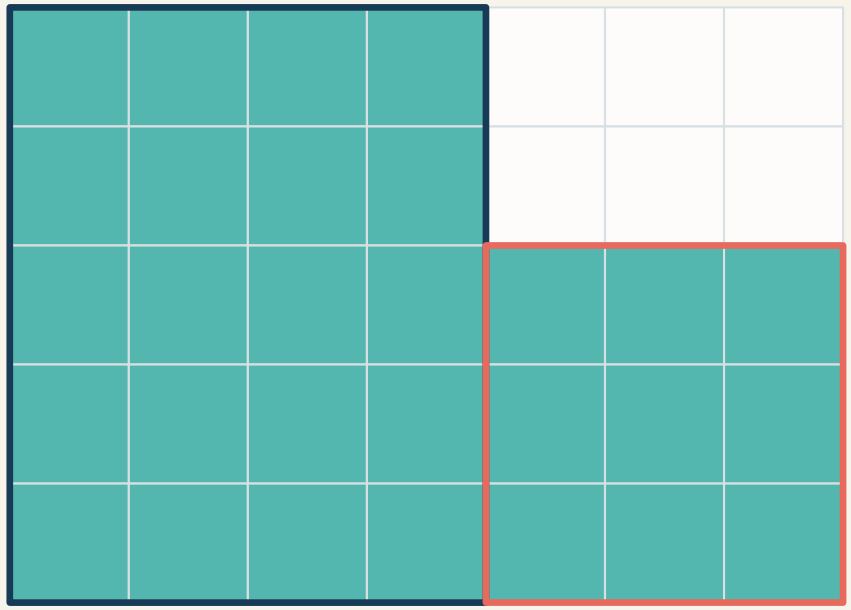
4 × 5 = 20 **3 × 3 = 9**

One way to decompose it:

1. Split the region into two rectangles.
2. Find each rectangle’s area.
3.

Example 1 — Solution

Find the area of this L-shaped region without counting every square.



4 × 5 = 20 **3 × 3 = 9**

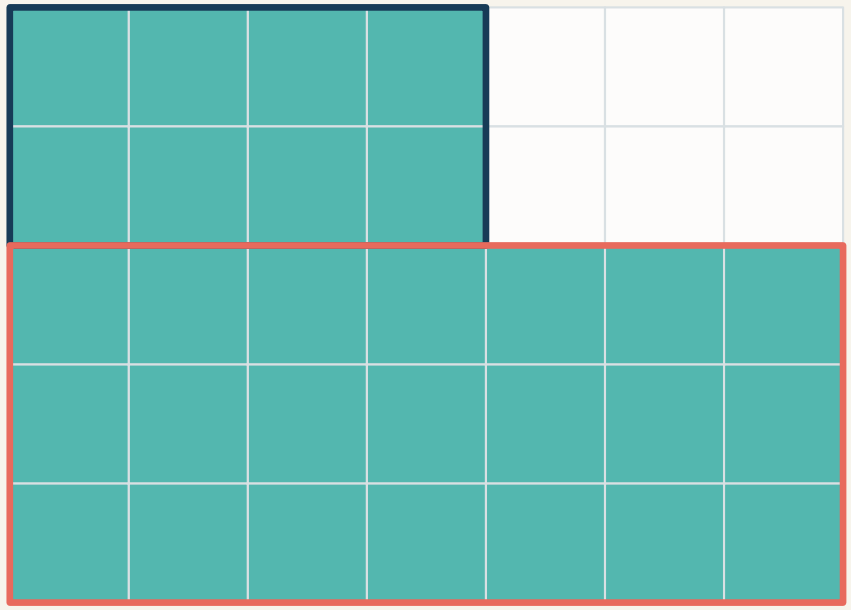
One way to decompose it:

1. Split the region into two rectangles.
2. Find each rectangle’s area.
3. Add the areas because the pieces do not overlap.

Area = (4 × 5) + (3 × 3) = 20 + 9 = 29 square units

Example 1 — Solution #2 (Horizontal Split)

Find the area of this L-shaped region without counting every square.



4 × 2 = 8 **7 × 3 = 21**

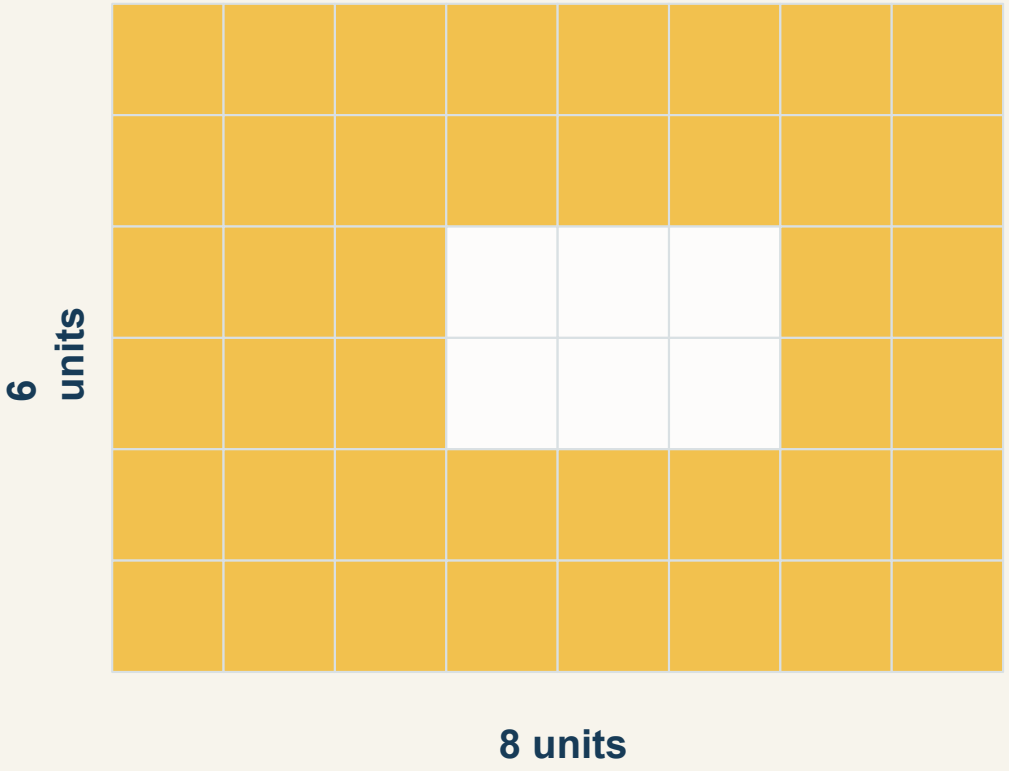
Another way to decompose it:

1. Split horizontally into two rectangles.
2. Find each rectangle's area.
3. Add the areas because the pieces do not overlap.

Area = (4 × 2) + (7 × 3) = 8 + 21 = 29 square units

Example 2 — Try it first

Find the area of the shaded region. Think before choosing a strategy.



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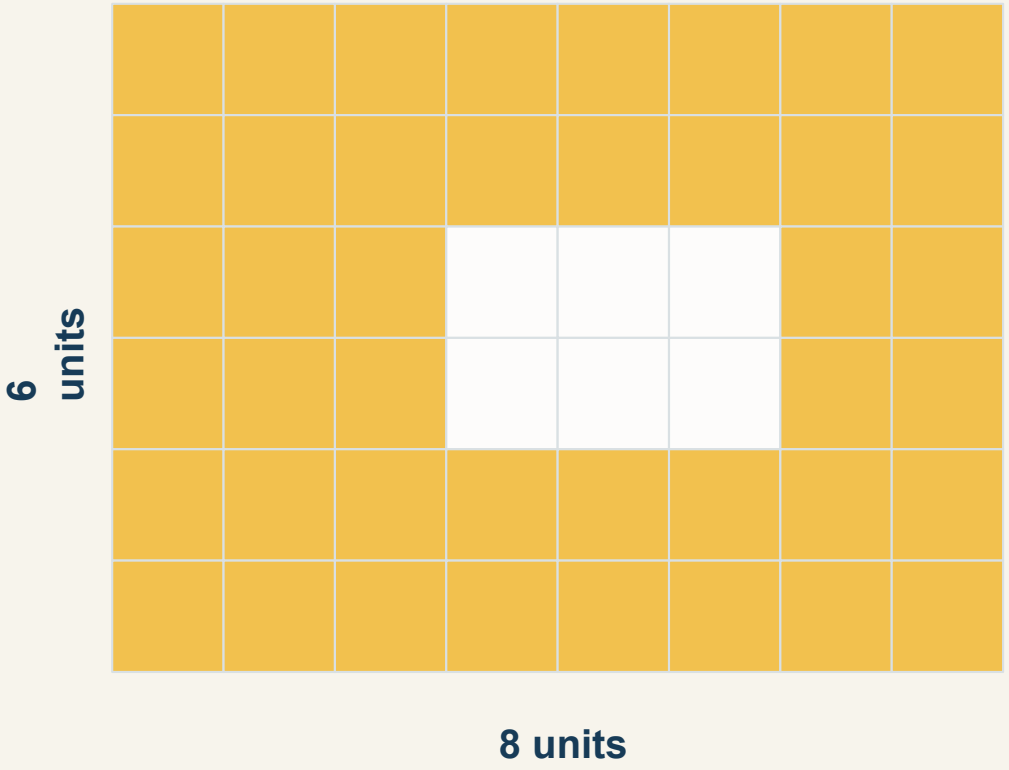
Example 2 — Step 1: Identify the whole and missing piece

Sometimes subtraction is faster than splitting into many pieces.

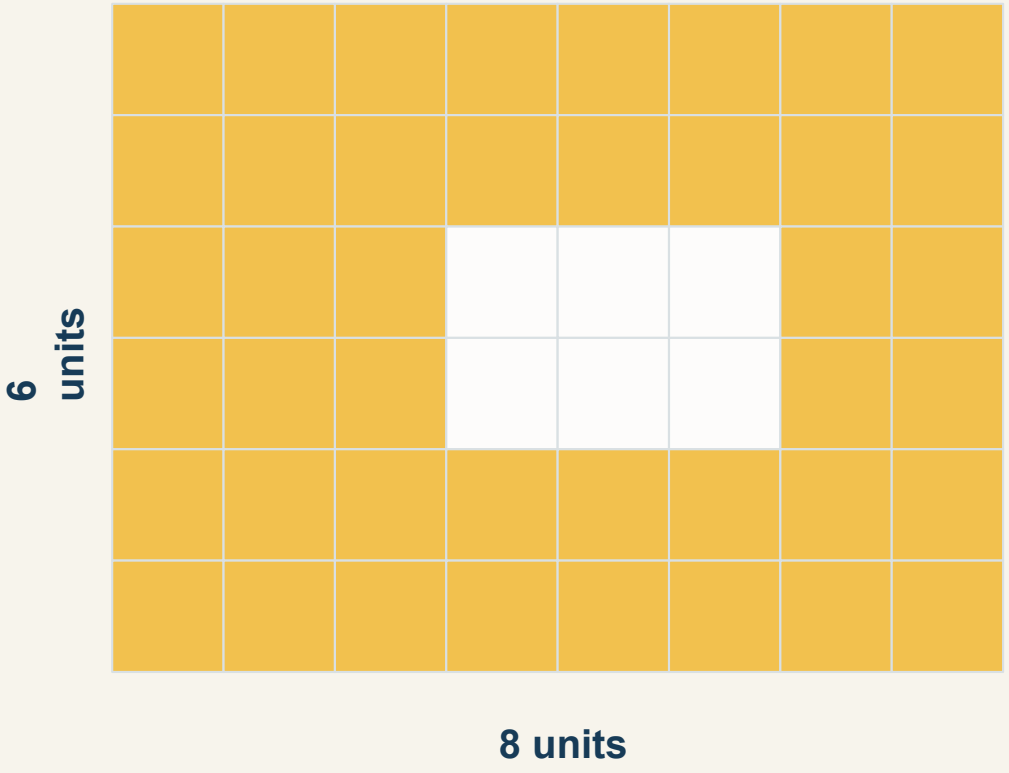


Think of the shaded region as:

whole rectangle **−** **missing rectangle**

Example 2 — Step 2: Write the subtraction

Sometimes subtraction is faster than splitting into many pieces.



Missing piece = 3 × 2

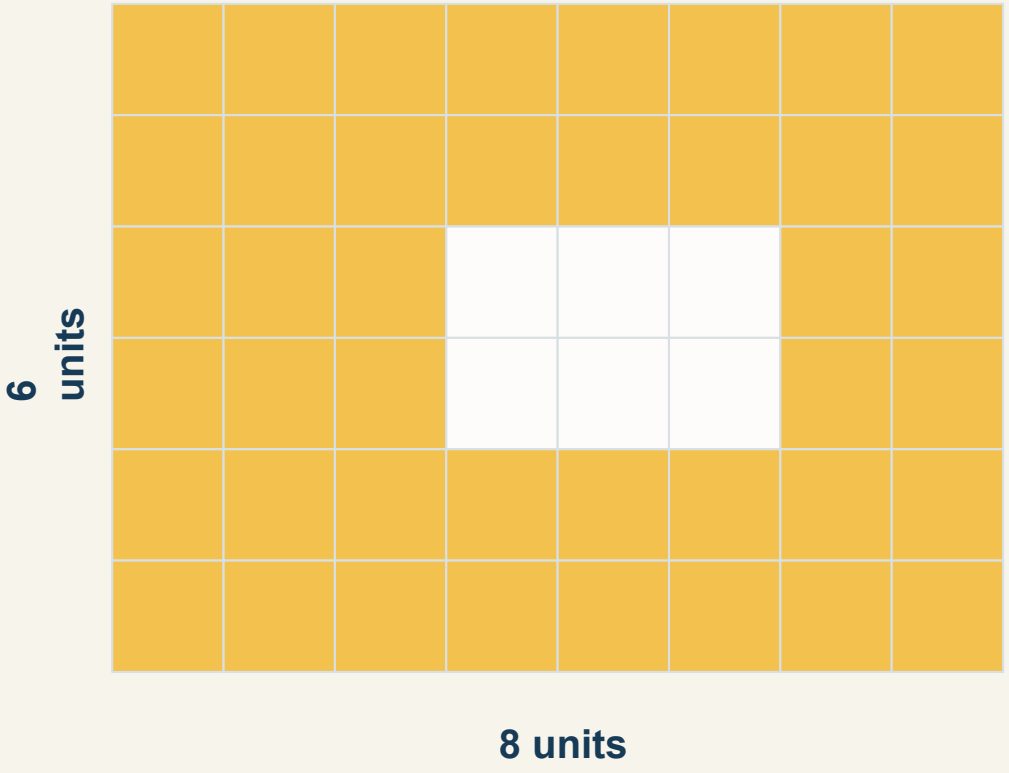
Think of the shaded region as:

whole rectangle − missing rectangle

$$(8 \times 6) - (3 \times 2)$$

Example 2 — Solution

Sometimes subtraction is faster than splitting into many pieces.



Missing piece = 3 × 2

Think of the shaded region as:

whole rectangle − missing rectangle

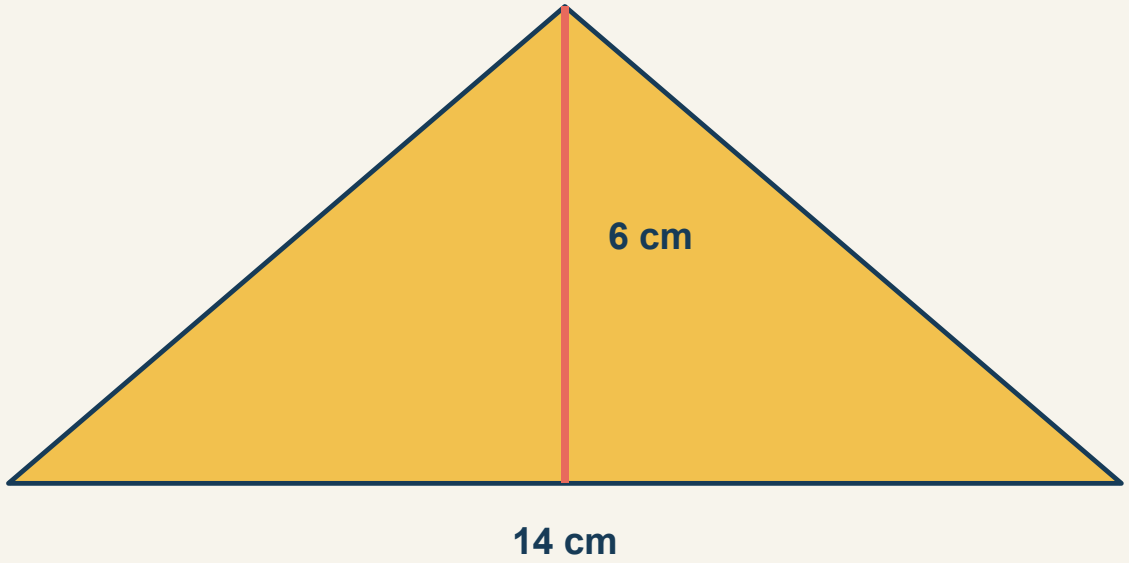
$$(8 \times 6) - (3 \times 2)$$

$$= 48 - 6$$
$$= 42 \text{ square units}$$

Efficiency matters: choose a strategy that makes the arithmetic simpler.

Example 3 — Try it first

Find the area of the symmetric triangle. Show your reasoning.



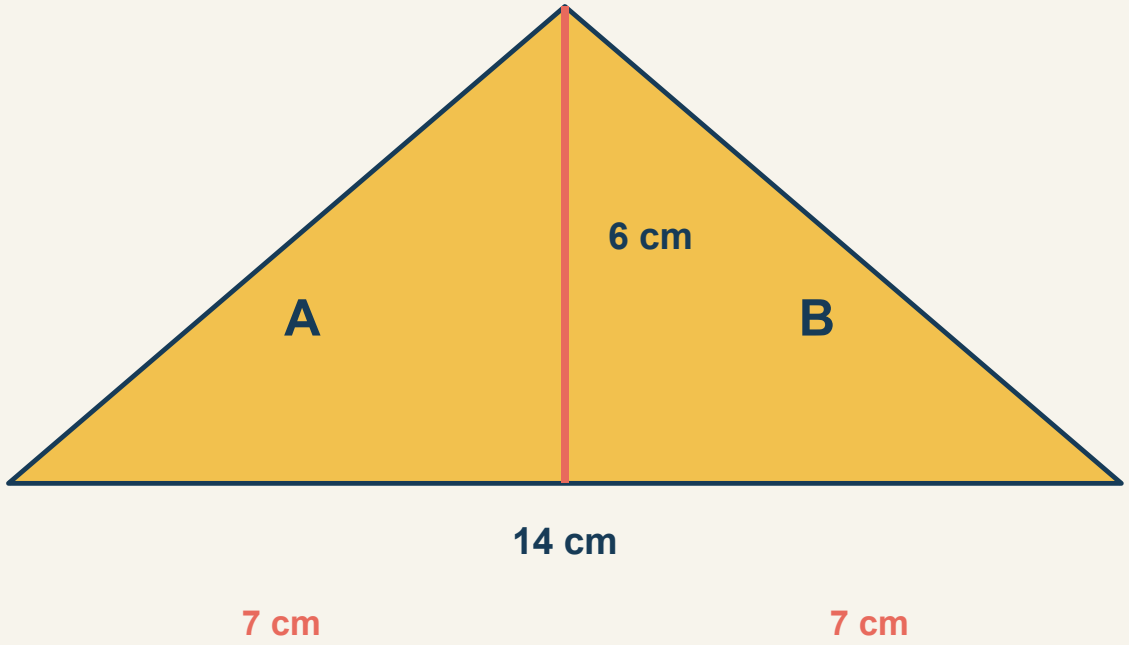
YOUR TURN

How can the height help you decompose this triangle into pieces you can rearrange?

Hint: The height splits the 14 cm base into two equal parts.

Example 3 — Step 1: Decompose

Split the symmetric triangle along its height.



1

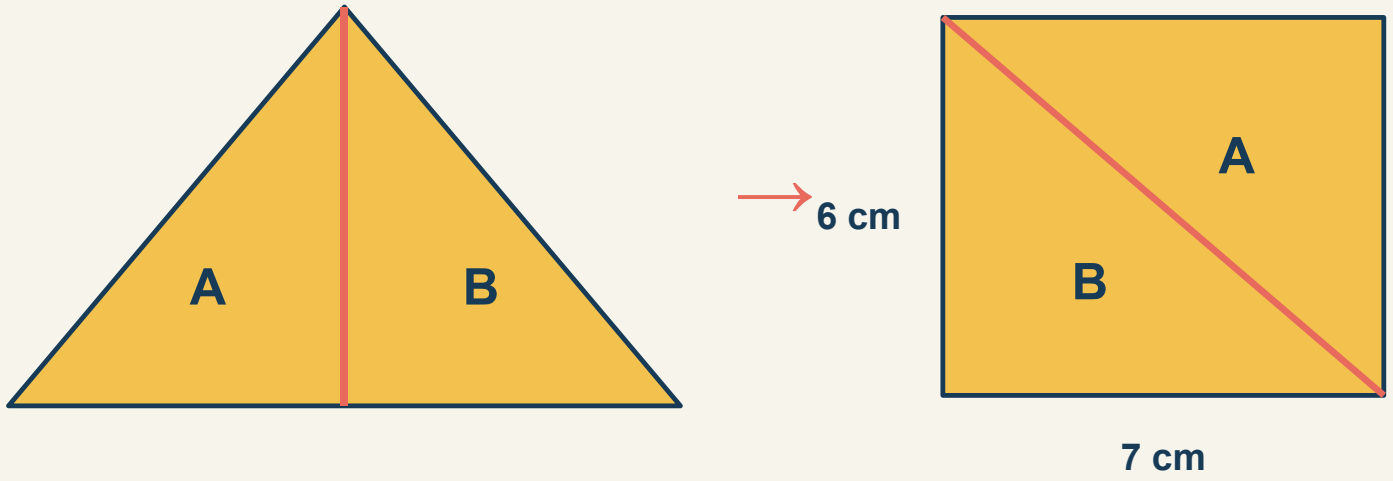
Identify equal pieces

The height creates two congruent right triangles. Each piece has a base of 7 cm and a height of 6 cm.

Next: move one triangle to compose a rectangle.

Example 3 — Step 2: Rearrange

Move the two right triangles to compose a rectangle.



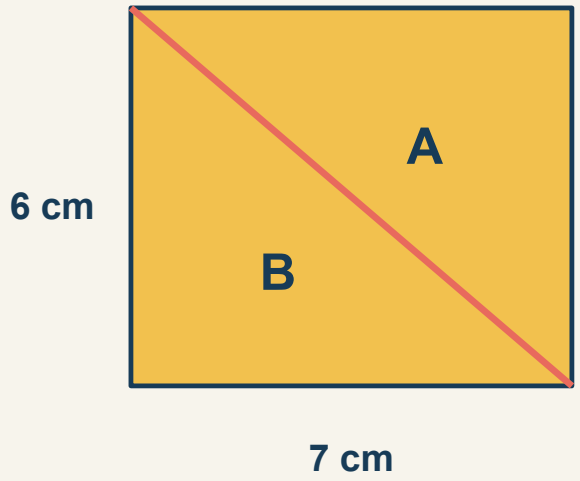
Same two pieces

The two halves compose a 7 cm by 6 cm rectangle. No pieces are resized.

No gaps. No overlaps.

Example 3 — Solution

Use the rearranged rectangle to find the triangle’s area.



Find the rectangle’s area

7 × 6 = 42 square centimeters

The rectangle uses exactly the two halves of the original triangle.

The triangle and rectangle have the same area because they use the same pieces.

Which area strategy should I use?

Different shapes invite different moves.

SPLIT + ADD	The figure naturally breaks into rectangles or triangles.	***"What simple pieces do I see?"***
MOVE + REARRANGE	A piece can slide or rotate to make a familiar shape.	***"Can I make a rectangle?"***
WHOLE − MISSING	The region looks like a familiar shape with a hole or cutout.	***"What would the full shape be?"***

There can be more than one correct strategy. A clear explanation is part of the math.

Common mistakes to avoid

Most errors come from counting or combining the wrong amount of space.

1

Using units instead of square units

Area is measured in square units: cm², m², square units.

2

Adding a missing piece instead of subtracting it

If the piece is not part of the region, remove its area.

3

Overlapping pieces after rearranging

The pieces must cover the new region exactly once.

4

Changing the size of a piece while moving it

Slide, turn, or flip pieces — do not stretch them.

Self-check: “Did I cover exactly the region I was asked about?”

Pause & think

Choose a strategy before doing any arithmetic.

A

A 10 × 7 rectangle has a 4 × 3 rectangular corner cut out.

Which strategy seems fastest?

- **split + add**
- **move pieces**
- **whole − missing**

B

Two congruent right triangles fit together to make a rectangle.

What fact lets you reason about the total area?

Explain to a partner using the words compose, decompose, or rearrange.

No need to solve yet — first decide how you would think about each shape.

Takeaway + exit ticket

If you can explain why your strategy preserves area, you are doing the important reasoning.

1 Area is coverage

Measure two-dimensional space in square units.

2 Pieces can move

Decompose and rearrange without changing total area.

3 Choose efficiently

Add pieces, rearrange, or subtract a missing part.

EXIT TICKET

In one sentence: Why can rearranging pieces help you find area?

Bonus: name one situation where subtraction would be the smartest strategy.

THANK YOU

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