Lesson 5-3 · Session 1

Trapezoids by Decomposing

Name _____ Date _____ Period _____

Maryland Standard 6.GR.1 · Learning target — I can find the area of a trapezoid by decomposing it into a rectangle and triangles.
Show a model, calculation, or explanation. Answer every part and label units when needed.

Exercises 1–12 earn 1 point for a correct response and 1 for supporting work. Spiral Review and Test Practice earn 1 point each.

Learn from a model

REMEMBER

- A trapezoid can be split (decomposed) into a rectangle and one or two triangles to find its area.
- Find the area of each piece, then add them together.
- Watch out — the two triangle bases together equal the difference of the two trapezoid bases.
- Check it — sketch the pieces and label every measure before you compute.

WORKED EXAMPLE

Finding a Trapezoid's Area by Decomposing An isosceles trapezoid has a top base of 8 m, a bottom base of 14 m, and a height of 6 m. Find the area.

Step 1 Decompose it: a rectangle in the middle and two matching triangles on the ends.

Step 2 Rectangle: top base by height. $8 \times 6 = 48$

Step 3 Leftover bottom: $14 - 8 = 6$, split evenly into two triangle bases of 3 m.

Step 4 Each triangle $\frac{1}{2} \times 3 \times 6 = 9$, so two give 18. $48 + 18 = 66$

Answer The area of the trapezoid is 66 square meters (66 m²).

Practice

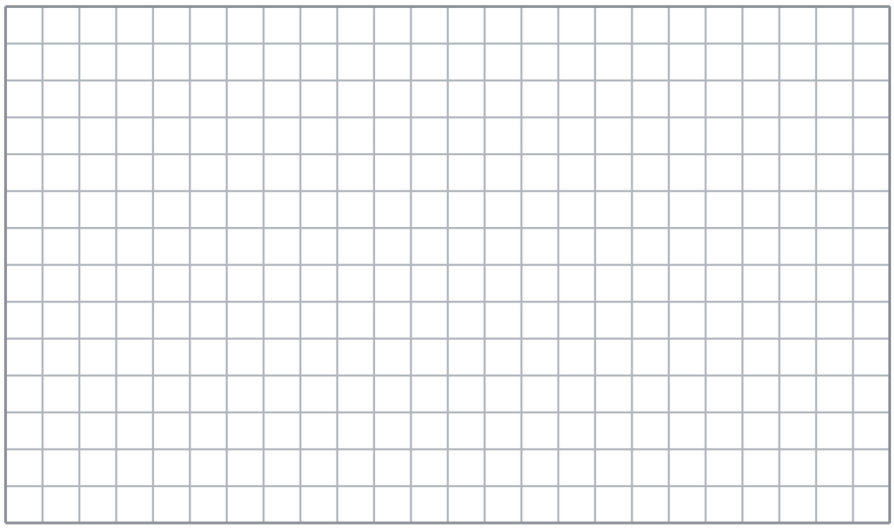
1. A trapezoid is decomposed into a rectangle with area 20 sq in and two triangles with areas 3 sq in each. Find the total area.

Answer _____

SHOW YOUR THINKING

2. Sketch a trapezoid and show one way to decompose it into a rectangle and triangle(s).

Sketch. Draw the trapezoid on the grid, then cut it into a rectangle and triangles.



Answer _____

SHOW YOUR THINKING

3. Why is decomposing a helpful strategy for finding the area of an odd shape?

Answer _____

EXPLAIN WITH MATHEMATICAL EVIDENCE

4. A trapezoid was cut into a rectangle and two matching triangles. Fill in each piece.

a. rectangle 9 cm by 5 cm _____ cm²
b. one triangle, base 4 cm, height 5 cm _____ cm²
c. total of the rectangle and both triangles _____ cm²
d. longer base 9 + 4 + 4 = _____ cm; shorter base = _____ cm

Answer _____

SHOW YOUR THINKING

5. Planter Face. The front of a planter is an isosceles trapezoid with bases of 10 ft and 18 ft and a height of 7 ft. Cut it into a rectangle and two matching triangles, then find the total area.

Answer _____

SHOW YOUR THINKING

6. Mural Border. A mural border is a trapezoid with one square corner. Its parallel sides measure 12 in. and 20 in., and the height between them is 9 in. Find its area by decomposing.

Answer _____

SHOW YOUR THINKING

7. Ramp Side. The side of a loading ramp is an isosceles trapezoid with bases of 6 m and 14 m and a height of 5 m. Find the total area.

Answer _____

SHOW YOUR THINKING

8. A trapezoid has bases of 8 in. and 16 in. and a height of 6 in. Amina cut it into a rectangle and two triangles and wrote ‘Area = 48 in².’ Explain her mistake, then show the correct total.

Answer _____

EXPLAIN WITH MATHEMATICAL EVIDENCE

9. A trapezoid has bases of 7 cm and 13 cm and a height of 4 cm. Decompose it and find the area.

Answer _____ cm²

SHOW YOUR THINKING

10. A trapezoid has bases of 9 m and 15 m and a height of 6 m. Find the area by decomposing.

Answer _____ m²

SHOW YOUR THINKING

11. Name the Pieces. For a trapezoid with bases 11 in. and 19 in. and height 5 in., find the rectangle piece and the triangle pieces separately.

Answer _____ rectangle and triangles

RECORD YOUR RESPONSE

12. Find the Mistake. Dana decomposed a trapezoid but used a height of 6 for the rectangle and 4 for the triangles. Explain the mistake.

Answer _____ the mistake

EXPLAIN WITH MATHEMATICAL EVIDENCE

Spiral review

13. From Lesson 5-2 Session 1. A triangle has base 24 in. and height 5 in. Find its area.

Answer _____

SHOW YOUR THINKING

14. From Lesson 5-1 Session 1. A parallelogram has base 9 cm and height 7 cm. Find its area.

Answer _____

SHOW YOUR THINKING

15. From Lesson 4-4 Session 1. Find 25% of 160.

Answer _____

SHOW YOUR THINKING

Test practice

16. A trapezoid decomposes into a rectangle and —

- □ A. two circles
- □ B. two triangles
- □ C. a cube
- □ D. a pyramid

17. A rectangle of 40 m² plus triangles of 14 m² gives —

□ A. 560 m²	□ B. 26 m²
□ C. 54 m²	□ D. 40 m²

18. If the bases are 8 and 14, the triangle bases total —

□ A. 14	□ B. 22
□ C. 8	□ D. 6

Check and revise

CHECK YOUR MATHEMATICS	HOW DID IT GO?
Use perpendicular height. Check square units for area and linear units for length. Every part answered / Work shown / Units labeled when needed	I can do this: Independently / With a hint / With help Question to revisit: _____

One correction or question I want to discuss: _____

Check each labeled measure and required face or region. Use square units for area and cubic units for volume.