UNIT 5 · STANDARD 6.G.1

Area of Trapezoids

Lesson 5-2

Name: _____ Date: _____ Class: _____

Key Vocabulary

Level 1 support

Picture first, then the word, then a plain-language meaning. Say each word out loud.

A table top wider than the bottom shelf — the top and bottom edges are parallel, the two sides slant inward

Trapezoid

A four-sided shape with just one pair of parallel sides.

If the bottom of the trapezoid is 10 ft, then $b_1 = 10$ ft in the formula $A = \frac{1}{2}(b_1 + b_2) \times h$

Base 1 (b1)

One of the two parallel sides of a trapezoid.

If the top of the trapezoid is 6 ft, then $b_2 = 6$ ft; both bases are parallel to each other

Base 2 (b2)

The other parallel side of a trapezoid.

A dashed vertical line from the top base straight down to the bottom base at a 90° angle — NOT the slanted side

Height

The straight-up distance between the two parallel sides.

A trapezoid with $b_1 = 10$, $b_2 = 6$, $h = 4$ has area = $\frac{1}{2}(10 + 6) \times 4 = 32$ sq units

Area

How much space is inside a flat shape.

Key Ideas & Notes

- Your architecture firm is designing a trapezoidal window for a modern building.
- The glass supplier charges by the square foot, so the team must calculate the exact area.
- The window has a top edge of 4 feet, a bottom edge of 8 feet, and a height of 5 feet.
- Plot the vertices of a trapezoid with bases of 8 and 4, and height of 5. Place points at (0, 0), (8, 0), (6, 5), and (2, 5).

Think About It

- What shape is the window?
- How many parallel sides does it have?
- What measurements are given?

My Notes

Guided Examples

Example 1

What is the area of a trapezoid with bases 6 cm and 10 cm, and height 4 cm?

Solution: $A = \frac{1}{2} \times (b_1 + b_2) \times h = \frac{1}{2} \times (6 + 10) \times 4 = \frac{1}{2} \times 16 \times 4 = 32$ sq cm.

Answer: A. 32 sq cm

Example 2

A trapezoid has an area of 45 sq ft, bases of 7 ft and 11 ft. What is the height?

Solution: $A = \frac{1}{2} \times (b_1 + b_2) \times h \rightarrow 45 = \frac{1}{2} \times 18 \times h \rightarrow 45 = 9h \rightarrow h = 5$ ft.

Answer: A. 5 ft

Example 3

What is the first step when finding the area of a trapezoid?

Solution: The formula is $A = \frac{1}{2} \times (b_1 + b_2) \times h$. The first step is to add the two parallel bases.

Answer: A. Add the two bases together

Write About the Math

The Writing Revolution

I can explain my steps using the words trapezoid, base, height, and area.

1. Kernel Sentence

subject + verb

Model: Trapezoid is a four-sided shape with just one pair of parallel sides.
Trapecio es una figura de cuatro lados con solo un par de lados paralelos.

Write a kernel sentence about trapezoid. Use a subject and a verb.
Escribe una oración base sobre trapecio. Usa un sujeto y un verbo.

_____

_____

2. Sentence Expansion

because · but · so

Kernel: Trapezoid matters in math
Trapecio importa en matemáticas

Expand the kernel three ways. Add a reason, a contrast, and a result.

because *porque*

Trapezoid matters in math because ____.
Trapecio importa en matemáticas porque ____.

_____

but *pero*

Trapezoid matters in math, but ____.
Trapecio importa en matemáticas, pero ____.

_____

so *entonces*

Trapezoid matters in math, so ____.
Trapecio importa en matemáticas, entonces ____.

_____

3. Sentence Types

4 ways to write a math idea

Statement
Afirmación

Tell one true fact about trapezoid.
Di un hecho verdadero sobre trapezoid.

Trapezoid ____.

Question
Pregunta

Ask a question about trapezoid.
Haz una pregunta sobre trapezoid.

How does ____ ?
¿Cómo ____ ?

Exclamation
Exclamación

Show excitement about trapezoid.
Muestra entusiasmo sobre trapezoid.

Wow, ____ !
¡Guau, ____ !

Command
Mandato

Tell a partner what to do with trapezoid.
Dile a un compañero qué hacer con trapezoid.

First, ____ .
Primero, ____ .

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4. Explain Your Reasoning

use a sentence starter

I added the two bases because ____.
Sumé las dos bases porque ____.

The area is ____.
El área es ____.

I see trapezoids in ____.
Veo trapecios en ____.

Try It

Solve on your own. Check the answer key when you are done.

1. What is the first step when finding the area of a trapezoid?

A. Add the two bases together

B. Multiply the two bases

C. Subtract the shorter base from the longer base

D. Divide the height by 2

Show your work:

2. A trapezoid has bases of 5 in and 9 in, and a height of 6 in. What is its area?

A. 42 sq in

B. 84 sq in

C. 27 sq in

D. 30 sq in

Show your work:

Stretch Your Thinking

Level 2 enrichment

Challenge task — explain your reasoning in full sentences.

A trapezoid and a parallelogram both have a height of 8 ft. The trapezoid has bases of 5 ft and 11 ft. The parallelogram has a base of 8 ft. Which shape has the greater area? Explain your reasoning using the formulas.

Sentence starter: The trapezoid's area is ____ because ½ × (____ + ____) × ____ = ____. The parallelogram's area is ____ because ____ × ____ = ____. The ____ has a greater area by ____ sq ft.

Show your work:

Reflect — Exit Ticket

A trapezoid has bases of 9 inches and 5 inches, and a height of 6 inches. What is its area?

A. 42 sq in

B. 84 sq in

C. 27 sq in

D. 42 in

Your answer:

Answer Key & Teacher Guide

1. **Try It 1:** A. Add the two bases together — *The formula is A = ½ × (b1 + b2) × h. The first step is to add the two parallel bases.*
2. **Try It 2:** A. 42 sq in — *A = ½ × (5 + 9) × 6 = ½ × 14 × 6 = ½ × 84 = 42 sq in.*
3. **Exit Ticket:** A. 42 sq in — *A = 1/2 x (b1 + b2) x h = 1/2 x (9 + 5) x 6 = 1/2 x 14 x 6 = 42 square inches.*

Writing (TWR) — what to look for

- **Kernel sentence:** A complete sentence needs a subject and a verb. Example: Trapezoid is a four-sided shape with just one pair of parallel sides.
- **Expansion:** *because* gives a reason, *but* shows a contrast or exception, *so* shows a result. Answers vary; each must keep the kernel idea and add the correct kind of detail.
- **Sentence types:** Statement ends with a period, question with "?", exclamation with "!", and a command starts with an action verb (a "bossy" verb).