LESSON MAKER PRO

Trapezoid Track

Use midsegments and angle relationships to solve.

HIGH SCHOOL · MA.912.GR.1.5

MA.912.GR.1.5 "Prove relationships and theorems about trapezoids. Solve mathematical and real-world problems involving postulates, relationships and theorems of trapezoids."

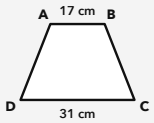
NAME _____ DATE _____

MIDSEGMENTS AND ANGLES

A segment joining the midpoints of a trapezoid's legs is parallel to both bases. Its length is the average of the base lengths. Also, the two angles on the same leg are supplementary.

WORKED EXAMPLE

The bases of a trapezoid are 17 cm and 31 cm. Find its midsegment length.



1. midsegment = (base 1 + base 2) / 2
2. midsegment = (17 + 31) / 2
3. midsegment = 48 / 2 = 24

Answer: 24 cm

PRACTICE 4 problems

1 The bases of a trapezoid are 14 cm and 26 cm. Find the midsegment length.

ANSWER _____

2 A trapezoid has a 23 m midsegment and one base of 16 m. Find the other base.

ANSWER _____

3 A trapezoid has bases x + 2 and 3x - 6. Its midsegment is 20. Find x.

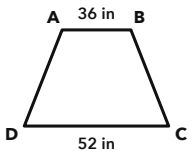
ANSWER _____

4 In trapezoid ABCD, AB || CD. m∠A = 3x + 8 and m∠D = 5x - 12. Find x and m∠A.

ANSWER _____

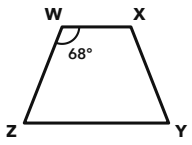
APPLY IT Show your work

1 The student council makes a trapezoid photo backdrop. Its parallel top and bottom edges are 36 in and 52 in. A support joins the midpoints of the slanted sides. How long is the support?



ANSWER _____

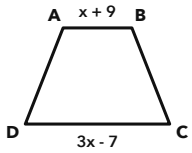
2 At a school concert, a trapezoid light frame has parallel top and bottom rails. One angle on a slanted side is 68°. Find the angle at the other end of that same slanted side.



ANSWER _____

CHALLENGE One step up

A trapezoid has bases x + 9 and 3x - 7. A segment joining the midpoints of its legs measures 21. Find x. Then explain why the segment is parallel to both bases.



WORK SPACE AND ANSWER

ANSWER KEY

Trapezoid Track

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	The bases of a trapezoid are 14 cm and 26 cm. Find the midsegment length.	**20 cm**
2	A trapezoid has a 23 m midsegment and one base of 16 m. Find the other base.	**30 m**
3	A trapezoid has bases x + 2 and 3x - 6. Its midsegment is 20. Find x.	**x = 11**
4	In trapezoid ABCD, AB ∥ CD. $m\angle A = 3x + 8$ and $m\angle D = 5x - 12$. Find x and $m\angle A$.	**x = 23; $m\angle A = 77°$**

PART 2 · APPLY IT

1. **44 in** The support is the midsegment. (36 + 52) / 2 = 44.
2. **112°** Angles on the same leg are supplementary. 180 - 68 = 112.

CHALLENGE

x = 10; the segment is parallel to both bases because it joins the midpoints of the trapezoid's legs.

Accept equivalent equations and correctly stated midpoint or supplementary-angle reasoning. For the challenge, accept any clear statement of the trapezoid midsegment theorem.