Area of Parallelograms and Trapezoids

Parallelogram and trapezoid area: Applications and decisions

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

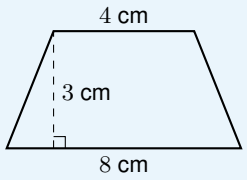
QUICK REVIEW

A parallelogram has $A = bh$, using perpendicular height: $b = 7, h = 4$ gives 28 cm^2. A trapezoid has $A = \frac{1}{2}(b_1 + b_2)h$: bases $4, 8$ and height 3 give $(4 + 8) \times 3/2 = 18$ cm^2. Slanted sides are not heights. Sketches are not to scale.

Worked example

Find the trapezoid area.

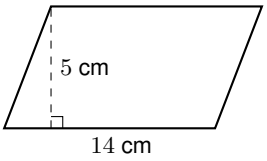
1. Average the parallel bases: $(4 + 8)/2 = 6$ cm.
2. Multiply by perpendicular height: $6 \times 3 = 18$ cm^2.
Answer: 18 cm^2.



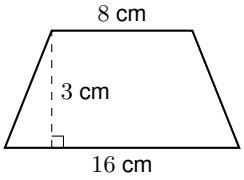
Practice Problems

Show your thinking.

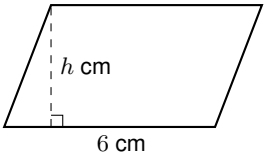
1. A banner is a parallelogram. Find fabric area.



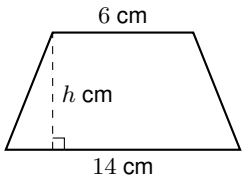
2. A trapezoid garden bed has dimensions in cm on a model. Find model area.



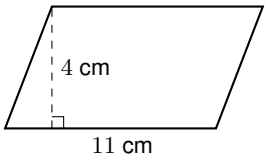
3. A designer fixes the base and area. Recover height. Area is 54 cm^2; find h.



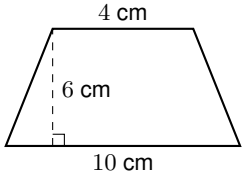
4. Design a trapezoid height for the known area. Area is 70 cm^2; find h.



5. A student calls the area 22 square cm by halving. Correct the sign area.



6. Find the area to compare with a 45-square-cm material budget.



Answer Key

1. 70 cm^2.
2. 36 cm^2.
3. 9 cm.
4. 7 cm.
5. 44 cm^2.
6. 42 cm^2. It is 3 cm^2 below the budget.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Rearrange the slanted side pieces into a rectangle with base 14 cm and height 5 cm.
2. $A = 14 \times 5 = 70$ cm^2.

Problem 2

1. Average the parallel bases: $(8 + 16)/2 = 12$ cm.
2. Multiply by perpendicular height: $12 \times 3 = 36$ cm^2.

Problem 3

1. The perpendicular base is 6 cm.
2. Area is $6h$, so $6h = 54$.
3. $h = 54/6 = 9$ cm; check $6 \times 9 = 54$.

Problem 4

1. Average the given parallel bases: $(6 + 14)/2 = 10$ cm.
2. Area is $10h$, so $10h = 70$.
3. $h = 70/10 = 7$ cm; check $10 \times 7 = 70$.

Problem 5

1. Rearrange the slanted side pieces into a rectangle with base 11 cm and height 4 cm.
2. $A = 11 \times 4 = 44$ cm^2.

Problem 6

1. Average the parallel bases: $(4 + 10)/2 = 7$ cm.
2. Multiply by perpendicular height: $7 \times 6 = 42$ cm^2.
3. $45 - 42 = 3$ cm^2 remains by area.

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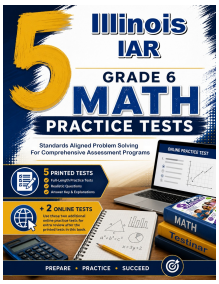

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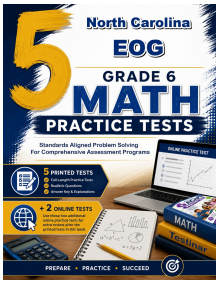

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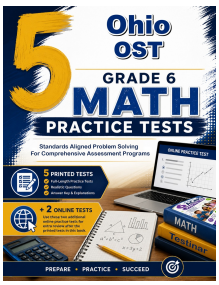

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