# Area of Parallelograms and Trapezoids

| Name: _____ | Date: _____ | Score: _____ / 24 |
|---|---|---|

## Quick Review

A **parallelogram** has two pairs of parallel sides. Its area is $A = b \times h$, where $b$ is the base and $h$ is the height measured straight up from that base — not the slanted side. A **trapezoid** has exactly one pair of parallel sides, called $b_1$ and $b_2$. Its area is $A = \frac{1}{2}(b_1 + b_2) \times h$: add the two parallel bases, multiply by the height, then take half. A good way to remember the trapezoid rule is that you are using the *average* of the two bases. Both areas are measured in **square units**.

◇ **Example:** Find the area of a trapezoid with parallel bases of $8$ m and $14$ m and a height of $6$ m.
⇒ Use the trapezoid formula $A = \frac{1}{2}(b_1 + b_2) \times h$. First add the two parallel bases: $8 + 14 = 22$. Next multiply by the height: $22 \times 6 = 132$. Finally take half: $\frac{1}{2} \times 132 = 66$. Since the measurements are in meters, the area is in square meters.

**Answer:** $66$ m$^2$

## PRACTICE

*Find the area of each figure. Parallelograms give base and height; trapezoids give both bases and height.*

1. Parallelogram: base $5$, height $4$ _____
2. Parallelogram: base $8$, height $6$ _____
3. Parallelogram: base $10$, height $3$ _____
4. Parallelogram: base $12$, height $7$ _____
5. Parallelogram: base $9$, height $9$ _____
6. Parallelogram: base $15$, height $4$ _____
7. Parallelogram: base $7$, height $8$ _____
8. Parallelogram: base $20$, height $5$ _____
9. Parallelogram: base $11$, height $6$ _____
10. Parallelogram: base $14$, height $10$ _____
11. Trapezoid: bases $6$ and $10$, height $4$ _____
12. Trapezoid: bases $5$ and $9$, height $6$ _____
13. Trapezoid: bases $8$ and $12$, height $5$ _____
14. Trapezoid: bases $7$ and $11$, height $8$ _____
15. Trapezoid: bases $10$ and $14$, height $6$ _____
16. Trapezoid: bases $4$ and $8$, height $9$ _____
17. Trapezoid: bases $12$ and $18$, height $10$ _____
18. Trapezoid: bases $9$ and $15$, height $7$ _____
19. Trapezoid: bases $5.5$ and $8.5$, height $4$ _____
20. Trapezoid: bases $13$ and $17$, height $12$ _____

### ♦ Word Problems

21. A wooden deck is shaped like a parallelogram with a base of $16$ feet and a height of $9$ feet. What is the area of the deck? _____

22. A tabletop is shaped like a trapezoid. The two parallel edges measure $20$ inches and $30$ inches, and the distance between them is $12$ inches. What is the area of the tabletop? _____

23. A parking space is shaped like a parallelogram with a base of $24$ feet and a height of $18$ feet. How many square feet of pavement does the space cover? _____

24. A vegetable garden is shaped like a trapezoid with parallel sides of $10$ m and $16$ m and a height of $8$ m. What is the area of the garden? _____

# Answer Keys

| | |
|---|---|
| **1.** $20$ | **13.** $50$ |
| **2.** $48$ | **14.** $72$ |
| **3.** $30$ | **15.** $72$ |
| **4.** $84$ | **16.** $54$ |
| **5.** $81$ | **17.** $150$ |
| **6.** $60$ | **18.** $84$ |
| **7.** $56$ | **19.** $28$ |
| **8.** $100$ | **20.** $180$ |
| **9.** $66$ | **21.** $144\ \text{ft}^2$ |
| **10.** $140$ | **22.** $300\ \text{in}^2$ |
| **11.** $32$ | **23.** $432\ \text{ft}^2$ |
| **12.** $42$ | **24.** $104\ \text{m}^2$ |

## Step-by-Step Explanations

**1.** For a parallelogram, $A = b \times h = 5 \times 4 = 20$.
**2.** Multiply base times height: $8 \times 6 = 48$.
**3.** Multiply base times height: $10 \times 3 = 30$.
**4.** Multiply base times height: $12 \times 7 = 84$.
**5.** Multiply base times height: $9 \times 9 = 81$.
**6.** Multiply base times height: $15 \times 4 = 60$.
**7.** Multiply base times height: $7 \times 8 = 56$.
**8.** Multiply base times height: $20 \times 5 = 100$.
**9.** Multiply base times height: $11 \times 6 = 66$.
**10.** Multiply base times height: $14 \times 10 = 140$.
**11.** Add the bases $6 + 10 = 16$, multiply by $4$ to get $64$, then half is $32$.
**12.** Add $5 + 9 = 14$, multiply by $6$ to get $84$, then half is $42$.
**13.** Add $8 + 12 = 20$, multiply by $5$ to get $100$, then half is $50$.
**14.** Add $7 + 11 = 18$, multiply by $8$ to get $144$, then half is $72$.
**15.** Add $10 + 14 = 24$, multiply by $6$ to get $144$, then half is $72$.
**16.** Add $4 + 8 = 12$, multiply by $9$ to get $108$, then half is $54$.
**17.** Add $12 + 18 = 30$, multiply by $10$ to get $300$, then half is $150$.
**18.** Add $9 + 15 = 24$, multiply by $7$ to get $168$, then half is $84$.
**19.** Add $5.5 + 8.5 = 14$, multiply by $4$ to get $56$, then half is $28$.
**20.** Add $13 + 17 = 30$, multiply by $12$ to get $360$, then half is $180$.
**21.** For a parallelogram, $A = b \times h$. Multiply $16 \times 9 = 144$ square feet.
**22.** Add the parallel bases: $20 + 30 = 50$. Multiply by the height: $50 \times 12 = 600$. Then take half: $\frac{1}{2} \times 600 = 300$ square inches.
**23.** Multiply base times height: $24 \times 18 = 432$ square feet.
**24.** Add the bases: $10 + 16 = 26$. Multiply by the height: $26 \times 8 = 208$. Then take half: $\frac{1}{2} \times 208 = 104$ square meters.

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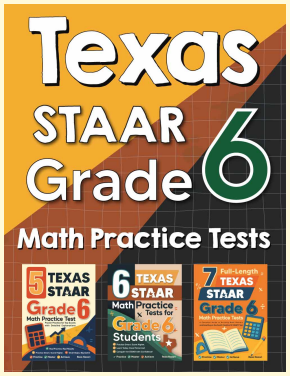


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