Composite Figures: Area and Perimeter

Name: _____	Date: _____	Score: _____ / 24

Quick Review

A **composite figure** is made of simpler shapes joined together — rectangles, triangles, semicircles, and so on. To find its **area**, break the figure into pieces you recognize, find each area, and then *add* them (or *subtract* when a piece is cut out). Useful formulas: rectangle $= l \times w$, triangle $= \frac{1}{2}bh$, circle $= \pi r^2$. For the **perimeter**, walk around the *outside* edge and add up only the boundary lengths — inner cut lines don't count. Take your time and label each piece.

◇ **Example:** A figure is a 12 m by 8 m rectangle with a triangle on top. The triangle has base 12 m and height 6 m. Find the total area.

⇒ Split the figure into the two shapes you know. The rectangle's area is length times width: $12 \times 8 = 96$ square meters. The triangle's area is $\frac{1}{2}$ base times height: $\frac{1}{2} \times 12 \times 6 = 36$ square meters. Since the triangle sits *on top of* the rectangle, add the two areas: $96 + 36 = 132$ square meters.

Answer: $A = 132$ m^2

PRACTICE

Find the area of each composite figure.

1. Rectangle 10×4 plus triangle base 10, $h = 3$ _____
2. Rectangle 6×5 plus square side 5 _____
3. Rectangle 8×8 plus triangle base 8, $h = 6$ _____
4. Two rectangles: 5×3 and 4×2 _____
5. Square side 10 minus square side 4 _____
6. Rectangle 12×7 minus rectangle 5×2 _____
7. Rectangle 9×6 plus rectangle 3×6 _____
8. Triangle base 10, $h = 8$ plus rectangle 10×4 _____
9. Square side 6 plus triangle base 6, $h = 4$ _____
10. Rectangle 14×5 minus triangle base 4, $h = 5$ _____
11. L-shape: 8×8 minus 4×4 _____
12. Rectangle 10×6 plus semicircle, $r = 3$ (use $\pi \approx 3.14$) _____
13. Two triangles: each base 6, $h = 4$ _____
14. Square side 12 minus triangle base 12, $h = 6$ _____
15. Rectangle 7×4 plus rectangle 7×4 _____
16. Rectangle 20×10 minus square side 5 _____
17. Perimeter of an L-shape: outer sides $10, 6, 4, 2, 6, 4$ _____
18. Perimeter of a 9×5 rectangle _____
19. Rectangle 15×8 plus triangle base 15, $h = 4$ _____
20. Square side 8 minus four corners, each 1×1 _____

Word Problems

21. A garden is shaped like a 20 ft by 12 ft rectangle with a triangular flower bed on one end. The triangle has base 12 ft and height 5 ft. What is the total area of the garden? _____
22. A rectangular sheet of metal is 14 in by 10 in. A rectangular hole 6 in by 4 in is cut from the middle. What area of metal remains? _____
23. A room floor is L-shaped. It can be split into a 12 ft by 8 ft rectangle and a 5 ft by 4 ft rectangle. How many square feet of carpet are needed? _____
24. A swimming pool deck is a 25 ft by 15 ft rectangle. The pool itself, a 15 ft by 10 ft rectangle, sits inside it. How much deck area surrounds the pool? _____

Answer Keys

1. 55	**13.** 24
2. 55	**14.** 108
3. 88	**15.** 56
4. 23	**16.** 175
5. 84	**17.** 32
6. 74	**18.** 28
7. 72	**19.** 150
8. 80	**20.** 60
9. 48	**21.** $270\ \text{ft}^2$
10. 60	**22.** $116\ \text{in}^2$
11. 48	**23.** $116\ \text{ft}^2$
12. 74.13	**24.** $225\ \text{ft}^2$

Step-by-Step Explanations

1. $40 + \frac{1}{2}(10)(3) = 40 + 15 = 55.$
2. $30 + 25 = 55.$
3. $64 + \frac{1}{2}(8)(6) = 64 + 24 = 88.$
4. $15 + 8 = 23.$
5. $100 - 16 = 84.$
6. $84 - 10 = 74.$
7. $54 + 18 = 72.$
8. $\frac{1}{2}(10)(8) + 40 = 40 + 40 = 80.$
9. $36 + \frac{1}{2}(6)(4) = 36 + 12 = 48.$
10. $70 - \frac{1}{2}(4)(5) = 70 - 10 = 60.$
11. $64 - 16 = 48.$
12. $60 + \frac{1}{2}(3.14)(9) = 60 + 14.13 = 74.13.$
13. Each is $\frac{1}{2}(6)(4) = 12$; total $12 + 12 = 24.$
14. $144 - \frac{1}{2}(12)(6) = 144 - 36 = 108.$
15. $28 + 28 = 56.$
16. $200 - 25 = 175.$
17. Add all outside edges: $10 + 6 + 4 + 2 + 6 + 4 = 32.$
18. $2(9) + 2(5) = 18 + 10 = 28.$
19. $120 + \frac{1}{2}(15)(4) = 120 + 30 = 150.$
20. $64 - 4(1) = 64 - 4 = 60.$
21. Rectangle area $= 20 \times 12 = 240\ \text{ft}^2$. Triangle area $= \frac{1}{2}(12)(5) = 30\ \text{ft}^2$. Total $= 240 + 30 = 270\ \text{ft}^2$.
22. Whole sheet $= 14 \times 10 = 140\ \text{in}^2$. Hole $= 6 \times 4 = 24\ \text{in}^2$. Remaining $= 140 - 24 = 116\ \text{in}^2$.
23. The two rectangles have areas $12 \times 8 = 96\ \text{ft}^2$ and $5 \times 4 = 20\ \text{ft}^2$. Together that is $96 + 20 = 116\ \text{ft}^2$.
24. Total area $= 25 \times 15 = 375\ \text{ft}^2$. Pool area $= 15 \times 10 = 150\ \text{ft}^2$. Deck $= 375 - 150 = 225\ \text{ft}^2$.

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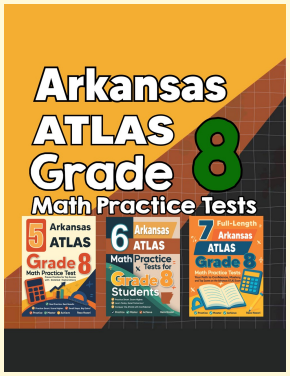

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