Finding Area on the Coordinate Plane

Name: _____	Date: _____	Score: _____ / 24

Quick Review

Once a polygon is drawn on the coordinate plane, you can find its **area** using the vertices. First find the side lengths: subtract matching x-coordinates for a horizontal length, or matching y-coordinates for a vertical length. For a **rectangle**, the area is length $\times$ width. For a **right triangle** with one horizontal side and one vertical side, those two sides are the base and the height, so the area is $\frac{1}{2} \times$ base $\times$ height. Counting coordinates carefully is the key — always subtract the smaller value from the larger.

◇ **Example:** A rectangle has vertices at $(1,1)$, $(1,5)$, $(8,5)$, and $(8,1)$. Find its area.

⇒ First find the two side lengths. From $(1,1)$ to $(1,5)$ the x stays the same, so this vertical side has length $5-1=4$. From $(1,5)$ to $(8,5)$ the y stays the same, so this horizontal side has length $8-1=7$. For a rectangle, the area is length times width: $7 \times 4 = 28$ square units.

Answer: 28 square units

PRACTICE

Find the area of each polygon from its vertices. Answers are in square units.

1. Rectangle $(0,0), (0,4), (5,4), (5,0)$ _____
2. Rectangle $(1,1), (1,7), (4,7), (4,1)$ _____
3. Rectangle $(2,2), (2,8), (8,8), (8,2)$ _____
4. Rectangle $(0,0), (0,3), (10,3), (10,0)$ _____
5. Rectangle $(1,2), (1,8), (5,8), (5,2)$ _____
6. Rectangle $(3,1), (3,6), (12,6), (12,1)$ _____
7. Rectangle $(0,0), (0,7), (7,7), (7,0)$ _____
8. Rectangle $(2,0), (2,5), (14,5), (14,0)$ _____
9. Rectangle $(-2,1), (-2,6), (6,6), (6,1)$ _____
10. Rectangle $(1,1), (1,11), (9,11), (9,1)$ _____
11. Right triangle $(0,0), (6,0), (0,4)$ _____
12. Right triangle $(0,0), (8,0), (0,3)$ _____
13. Right triangle $(2,1), (8,1), (2,9)$ _____
14. Right triangle $(1,1), (11,1), (1,5)$ _____
15. Right triangle $(0,0), (0,10), (7,0)$ _____
16. Right triangle $(3,2), (3,12), (15,2)$ _____
17. Right triangle $(0,0), (9,0), (0,9)$ _____
18. Right triangle $(1,1), (13,1), (1,6)$ _____
19. Right triangle $(2,2), (2,16), (10,2)$ _____
20. Right triangle $(0,0), (20,0), (0,6)$ _____

♦ Word Problems

21. A rug is mapped as a rectangle with corners at $(0,0)$, $(0,6)$, $(9,6)$, and $(9,0)$, measured in feet. What is the area of the rug? _____

22. A triangular garden has corners at $(0,0)$, $(10,0)$, and $(0,8)$, measured in meters. How many square meters of soil will cover the garden? _____

23. A poster is shaped like a rectangle with corners at $(2,2)$, $(2,14)$, $(10,14)$, and $(10,2)$, measured in inches. What is the area of the poster? _____

24. A sail is shaped like a right triangle with corners at $(0,0)$, $(0,12)$, and $(5,0)$, measured in feet. What is the area of the sail? _____

Answer Keys

1. $\boxed{20}$	**13.** $\boxed{24}$
2. $\boxed{18}$	**14.** $\boxed{20}$
3. $\boxed{36}$	**15.** $\boxed{35}$
4. $\boxed{30}$	**16.** $\boxed{60}$
5. $\boxed{24}$	**17.** $\boxed{40.5}$
6. $\boxed{45}$	**18.** $\boxed{30}$
7. $\boxed{49}$	**19.** $\boxed{56}$
8. $\boxed{60}$	**20.** $\boxed{60}$
9. $\boxed{40}$	**21.** $\boxed{54\ \text{ft}^2}$
10. $\boxed{80}$	**22.** $\boxed{40\ \text{m}^2}$
11. $\boxed{12}$	**23.** $\boxed{96\ \text{in}^2}$
12. $\boxed{12}$	**24.** $\boxed{30\ \text{ft}^2}$

Step-by-Step Explanations

1. The sides are 4 and 5, so the area is $5 \times 4 = 20$.
2. The sides are 6 and 3, so the area is $6 \times 3 = 18$.
3. The sides are 6 and 6, so the area is $6 \times 6 = 36$.
4. The sides are 3 and 10, so the area is $10 \times 3 = 30$.
5. The sides are 6 and 4, so the area is $6 \times 4 = 24$.
6. The sides are 5 and 9, so the area is $9 \times 5 = 45$.
7. The sides are 7 and 7, so the area is $7 \times 7 = 49$.
8. The sides are 5 and 12, so the area is $12 \times 5 = 60$.
9. The sides are 5 and 8, so the area is $8 \times 5 = 40$.
10. The sides are 10 and 8, so the area is $10 \times 8 = 80$.
11. The legs are 6 and 4, so the area is $\frac{1}{2} \times 6 \times 4 = 12$.
12. The legs are 8 and 3, so the area is $\frac{1}{2} \times 8 \times 3 = 12$.
13. The legs are 6 and 8, so the area is $\frac{1}{2} \times 6 \times 8 = 24$.
14. The legs are 10 and 4, so the area is $\frac{1}{2} \times 10 \times 4 = 20$.
15. The legs are 10 and 7, so the area is $\frac{1}{2} \times 10 \times 7 = 35$.
16. The legs are 10 and 12, so the area is $\frac{1}{2} \times 10 \times 12 = 60$.
17. The legs are 9 and 9, so the area is $\frac{1}{2} \times 9 \times 9 = 40.5$.
18. The legs are 12 and 5, so the area is $\frac{1}{2} \times 12 \times 5 = 30$.
19. The legs are 14 and 8, so the area is $\frac{1}{2} \times 14 \times 8 = 56$.
20. The legs are 20 and 6, so the area is $\frac{1}{2} \times 20 \times 6 = 60$.
21. The sides are $6 - 0 = 6$ ft and $9 - 0 = 9$ ft. The area of a rectangle is $9 \times 6 = 54$ square feet.
22. The horizontal leg is 10 m and the vertical leg is 8 m. The area of the right triangle is $\frac{1}{2} \times 10 \times 8 = 40$ square meters.
23. The sides are $14 - 2 = 12$ in and $10 - 2 = 8$ in. The area is $12 \times 8 = 96$ square inches.
24. The vertical leg is 12 ft and the horizontal leg is 5 ft. The area is $\frac{1}{2} \times 12 \times 5 = 30$ square feet.

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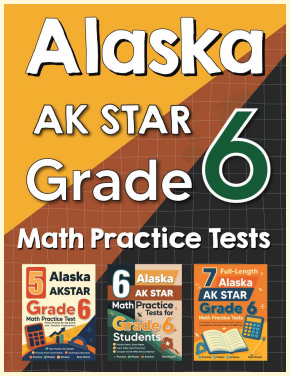

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