

# Finding Area on the Coordinate Plane

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ / 24

## Q 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.

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

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|--|--|
| <p>1. <input type="text" value="20"/></p> <p>2. <input type="text" value="18"/></p> <p>3. <input type="text" value="36"/></p> <p>4. <input type="text" value="30"/></p> <p>5. <input type="text" value="24"/></p> <p>6. <input type="text" value="45"/></p> <p>7. <input type="text" value="49"/></p> <p>8. <input type="text" value="60"/></p> <p>9. <input type="text" value="40"/></p> <p>10. <input type="text" value="80"/></p> <p>11. <input type="text" value="12"/></p> <p>12. <input type="text" value="12"/></p> | <p>13. <input type="text" value="24"/></p> <p>14. <input type="text" value="20"/></p> <p>15. <input type="text" value="35"/></p> <p>16. <input type="text" value="60"/></p> <p>17. <input type="text" value="40.5"/></p> <p>18. <input type="text" value="30"/></p> <p>19. <input type="text" value="56"/></p> <p>20. <input type="text" value="60"/></p> <p>21. <input type="text" value="54 ft&lt;sup&gt;2&lt;/sup&gt;"/></p> <p>22. <input type="text" value="40 m&lt;sup&gt;2&lt;/sup&gt;"/></p> <p>23. <input type="text" value="96 in&lt;sup&gt;2&lt;/sup&gt;"/></p> <p>24. <input type="text" value="30 ft&lt;sup&gt;2&lt;/sup&gt;"/></p> |
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### Step-by-Step Explanations

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