

# Polygons on the Coordinate Plane

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_ / 24

## Q Quick Review

You can draw **polygons** on the coordinate plane by plotting their **vertices** (corner points). Each vertex is an ordered pair  $(x, y)$ . When two points share the same  $x$ -coordinate, the segment between them is **vertical**, and its length is the difference of the  $y$ -coordinates. When two points share the same  $y$ -coordinate, the segment is **horizontal**, and its length is the difference of the  $x$ -coordinates. Once you know the side lengths, you can find the **perimeter** by adding all the sides. Always subtract the smaller value from the larger one so the length is positive.

◇ **Example:** A rectangle has vertices at  $(2, 1)$ ,  $(2, 5)$ ,  $(7, 5)$ , and  $(7, 1)$ . Find its perimeter.

⇒ Look at the points that share coordinates. From  $(2, 1)$  to  $(2, 5)$  the  $x$  stays at 2, so this side is vertical: its length is  $5 - 1 = 4$ . From  $(2, 5)$  to  $(7, 5)$  the  $y$  stays at 5, so this side is horizontal: its length is  $7 - 2 = 5$ . A rectangle has two sides of each length, so the perimeter is  $4 + 5 + 4 + 5 = 18$  units.

**Answer:** 18 units

## PRACTICE

Use the coordinates to find each length or perimeter. Treat answers as units.

- |  |  |
|--|--|
| 1. Length from $(1, 2)$ to $(1, 7)$ _____                                  | 13. Perimeter: square $(4, 4)$ , $(4, 10)$ , $(10, 10)$ , $(10, 4)$ _____  |
| 2. Length from $(3, 4)$ to $(9, 4)$ _____                                  | 14. Perimeter: rectangle $(0, 0)$ , $(0, 5)$ , $(12, 5)$ , $(12, 0)$ _____ |
| 3. Length from $(2, 2)$ to $(2, 10)$ _____                                 | 15. Perimeter: rectangle $(3, 1)$ , $(3, 7)$ , $(11, 7)$ , $(11, 1)$ _____ |
| 4. Length from $(0, 5)$ to $(12, 5)$ _____                                 | 16. Perimeter: square $(-3, 2)$ , $(-3, 7)$ , $(2, 7)$ , $(2, 2)$ _____    |
| 5. Length from $(4, 1)$ to $(4, 9)$ _____                                  | 17. Perimeter: rectangle $(5, 0)$ , $(5, 9)$ , $(15, 9)$ , $(15, 0)$ _____ |
| 6. Length from $(6, 3)$ to $(6, 11)$ _____                                 | 18. Perimeter: rectangle $(2, -2)$ , $(2, 4)$ , $(9, 4)$ , $(9, -2)$ _____ |
| 7. Length from $(-2, 4)$ to $(5, 4)$ _____                                 | 19. Perimeter: square $(0, 0)$ , $(0, 8)$ , $(8, 8)$ , $(8, 0)$ _____      |
| 8. Length from $(3, -1)$ to $(3, 6)$ _____                                 | 20. Perimeter: rectangle $(1, 1)$ , $(1, 13)$ , $(6, 13)$ , $(6, 1)$ _____ |
| 9. Perimeter: square with side from $(1, 1)$ to $(1, 6)$ _____             |  |
| 10. Perimeter: rectangle $(0, 0)$ , $(0, 3)$ , $(8, 3)$ , $(8, 0)$ _____   |  |
| 11. Perimeter: rectangle $(2, 2)$ , $(2, 9)$ , $(6, 9)$ , $(6, 2)$ _____   |  |
| 12. Perimeter: rectangle $(1, 3)$ , $(1, 8)$ , $(10, 8)$ , $(10, 3)$ _____ |  |

## ◆ Word Problems

21. A garden plot is mapped as a rectangle with corners at  $(0, 0)$ ,  $(0, 6)$ ,  $(10, 6)$ , and  $(10, 0)$ , measured in meters. How many meters of fencing are needed to go around it? \_\_\_\_\_
22. On a city map, a square park has corners at  $(2, 2)$ ,  $(2, 9)$ ,  $(9, 9)$ , and  $(9, 2)$ , measured in blocks. How many blocks is it to walk all the way around the park? \_\_\_\_\_
23. A rectangular swimming pool is drawn with corners at  $(1, 1)$ ,  $(1, 5)$ ,  $(13, 5)$ , and  $(13, 1)$ , measured in feet. What is the perimeter of the pool? \_\_\_\_\_
24. A banner is shaped like a rectangle with corners at  $(0, 0)$ ,  $(0, 4)$ ,  $(15, 4)$ , and  $(15, 0)$ , measured in inches. How much ribbon is needed to trim its entire edge? \_\_\_\_\_



## Answer Keys

- |                                     |  |
|-------------------------------------|--|
| 1. <input type="text" value="5"/>   | 13. <input type="text" value="24"/>        |
| 2. <input type="text" value="6"/>   | 14. <input type="text" value="34"/>        |
| 3. <input type="text" value="8"/>   | 15. <input type="text" value="28"/>        |
| 4. <input type="text" value="12"/>  | 16. <input type="text" value="20"/>        |
| 5. <input type="text" value="8"/>   | 17. <input type="text" value="38"/>        |
| 6. <input type="text" value="8"/>   | 18. <input type="text" value="26"/>        |
| 7. <input type="text" value="7"/>   | 19. <input type="text" value="32"/>        |
| 8. <input type="text" value="7"/>   | 20. <input type="text" value="34"/>        |
| 9. <input type="text" value="20"/>  | 21. <input type="text" value="32 m"/>      |
| 10. <input type="text" value="22"/> | 22. <input type="text" value="28 blocks"/> |
| 11. <input type="text" value="22"/> | 23. <input type="text" value="32 ft"/>     |
| 12. <input type="text" value="28"/> | 24. <input type="text" value="38 in"/>     |

### Step-by-Step Explanations

- |  |  |
|--|--|
| <p>1. The <math>x</math>-values match, so subtract the <math>y</math>-values: <math>7 - 2 = 5</math>.</p> <p>2. The <math>y</math>-values match, so subtract the <math>x</math>-values: <math>9 - 3 = 6</math>.</p> <p>3. The <math>x</math>-values match, so subtract the <math>y</math>-values: <math>10 - 2 = 8</math>.</p> <p>4. The <math>y</math>-values match, so subtract the <math>x</math>-values: <math>12 - 0 = 12</math>.</p> <p>5. The <math>x</math>-values match, so subtract: <math>9 - 1 = 8</math>.</p> <p>6. The <math>x</math>-values match, so subtract the <math>y</math>-values: <math>11 - 3 = 8</math>.</p> <p>7. The <math>y</math>-values match, so subtract: <math>5 - (-2) = 7</math>.</p> <p>8. The <math>x</math>-values match, so subtract: <math>6 - (-1) = 7</math>.</p> <p>9. The side length is <math>6 - 1 = 5</math>. A square has 4 equal sides: <math>5 \times 4 = 20</math>.</p> <p>10. The sides are 3 and 8. Perimeter is <math>3 + 8 + 3 + 8 = 22</math>.</p> <p>11. The sides are 7 and 4. Perimeter is <math>7 + 4 + 7 + 4 = 22</math>.</p> <p>12. The sides are 5 and 9. Perimeter is <math>5 + 9 + 5 + 9 = 28</math>.</p> <p>13. The side length is 6. A square has 4 equal sides: <math>6 \times 4 = 24</math>.</p> <p>14. The sides are 5 and 12. Perimeter is <math>5 + 12 + 5 + 12 = 34</math>.</p> | <p>15. The sides are 6 and 8. Perimeter is <math>6 + 8 + 6 + 8 = 28</math>.</p> <p>16. The side length is 5. A square has 4 equal sides: <math>5 \times 4 = 20</math>.</p> <p>17. The sides are 9 and 10. Perimeter is <math>9 + 10 + 9 + 10 = 38</math>.</p> <p>18. The sides are 6 and 7. Perimeter is <math>6 + 7 + 6 + 7 = 26</math>.</p> <p>19. The side length is 8. A square has 4 equal sides: <math>8 \times 4 = 32</math>.</p> <p>20. The sides are 12 and 5. Perimeter is <math>12 + 5 + 12 + 5 = 34</math>.</p> <p>21. The vertical side is <math>6 - 0 = 6</math> m and the horizontal side is <math>10 - 0 = 10</math> m. The perimeter is <math>6 + 10 + 6 + 10 = 32</math> meters of fencing.</p> <p>22. Each side is <math>9 - 2 = 7</math> blocks long. A square has 4 equal sides, so the perimeter is <math>7 \times 4 = 28</math> blocks.</p> <p>23. The short side is <math>5 - 1 = 4</math> ft and the long side is <math>13 - 1 = 12</math> ft. The perimeter is <math>4 + 12 + 4 + 12 = 32</math> feet.</p> <p>24. The height is <math>4 - 0 = 4</math> in and the width is <math>15 - 0 = 15</math> in. The perimeter is <math>4 + 15 + 4 + 15 = 38</math> inches of ribbon.</p> |
|--|--|



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