

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