Polygons on the Coordinate Plane

Name: _____	Date: _____	Score: _____ / 24

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

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. 5	**13.** 24
2. 6	**14.** 34
3. 8	**15.** 28
4. 12	**16.** 20
5. 8	**17.** 38
6. 8	**18.** 26
7. 7	**19.** 32
8. 7	**20.** 34
9. 20	**21.** 32 m
10. 22	**22.** 28 blocks
11. 22	**23.** 32 ft
12. 28	**24.** 38 in

Step-by-Step Explanations

1. The x-values match, so subtract the y-values: $7 - 2 = 5$.
2. The y-values match, so subtract the x-values: $9 - 3 = 6$.
3. The x-values match, so subtract the y-values: $10 - 2 = 8$.
4. The y-values match, so subtract the x-values: $12 - 0 = 12$.
5. The x-values match, so subtract: $9 - 1 = 8$.
6. The x-values match, so subtract the y-values: $11 - 3 = 8$.
7. The y-values match, so subtract: $5 - (-2) = 7$.
8. The x-values match, so subtract: $6 - (-1) = 7$.
9. The side length is $6 - 1 = 5$. A square has 4 equal sides: $5 \times 4 = 20$.
10. The sides are 3 and 8. Perimeter is $3 + 8 + 3 + 8 = 22$.
11. The sides are 7 and 4. Perimeter is $7 + 4 + 7 + 4 = 22$.
12. The sides are 5 and 9. Perimeter is $5 + 9 + 5 + 9 = 28$.
13. The side length is 6. A square has 4 equal sides: $6 \times 4 = 24$.
14. The sides are 5 and 12. Perimeter is $5 + 12 + 5 + 12 = 34$.
15. The sides are 6 and 8. Perimeter is $6 + 8 + 6 + 8 = 28$.
16. The side length is 5. A square has 4 equal sides: $5 \times 4 = 20$.
17. The sides are 9 and 10. Perimeter is $9 + 10 + 9 + 10 = 38$.
18. The sides are 6 and 7. Perimeter is $6 + 7 + 6 + 7 = 26$.
19. The side length is 8. A square has 4 equal sides: $8 \times 4 = 32$.
20. The sides are 12 and 5. Perimeter is $12 + 5 + 12 + 5 = 34$.
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.
22. Each side is $9 - 2 = 7$ blocks long. A square has 4 equal sides, so the perimeter is $7 \times 4 = 28$ blocks.
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.
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.

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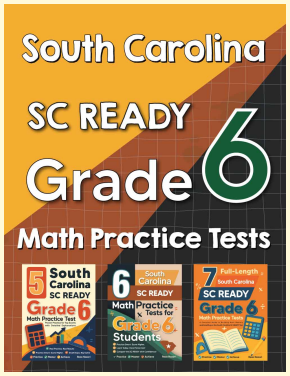

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