Coordinate Garden Fence

Plot a polygon and measure horizontal and vertical sides

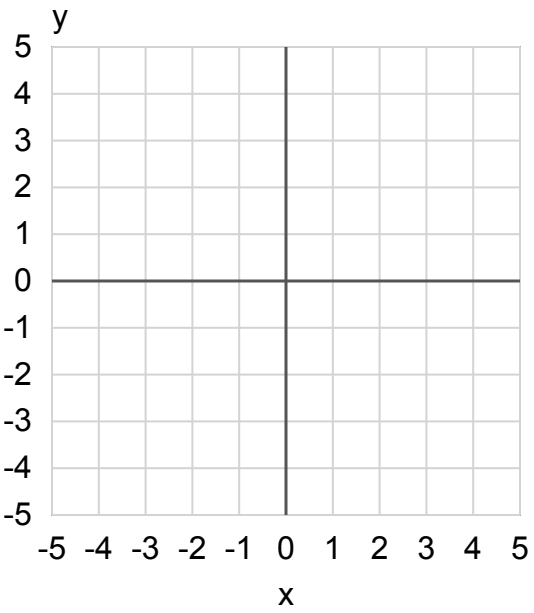
Name: _____ Date: _____

Part 1 - Plot the garden

Fictional School Garden Map

A rectangular garden has these corner coordinates. Plot each point on the grid. Label the points P, Q, R, and S. Then connect P to Q to R to S and back to P.

Corner	Coordinate
P	(-4, -2)
Q	(3, -2)
R	(3, 2)
S	(-4, 2)



Check: Did you connect the points in order and return to P?

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Part 2 - Measure and fence

Each grid unit represents **2 meters** of fence. For a horizontal side, subtract the x-coordinates. For a vertical side, subtract the y-coordinates. Use the positive distance.

Side	Coordinates used	Work	Length in grid units
PQ			
QR			
RS			
SP			

1. What is the perimeter of the garden in grid units? Show an addition equation.

2. How many meters of fence are needed? Explain how you used the scale.

Reminder: This coordinate-difference method works here because each side is horizontal or vertical. It does not directly find a diagonal length.

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Answer key and teaching notes

Materials and setup

Print and supply all student pages, keeping teacher-key pages separate. Materials: student pages, pencils, rulers, and optional highlighters. Students need no calculator. Before class, confirm that the graph prints clearly and that students can see the x-axis and y-axis.

Teacher script

Say: “Coordinates name a location: x tells left or right, and y tells up or down. Plot P first, then plot the other points. Connect the points in the order named.” After plotting, say: “For a horizontal side, the y-values match, so compare the x-values. For a vertical side, the x-values match, so compare the y-values. Distance is positive.” Say: “The scale tells us that one grid unit represents 2 meters.”

Observe

While students work, check that each student (1) places P at (-4, -2), Q at (3, -2), R at (3, 2), and S at (-4, 2); (2) connects the vertices in order; (3) compares matching-coordinate values rather than counting a diagonal; and (4) multiplies the perimeter in grid units by 2 meters per unit. Prompt, but do not supply an answer: “Which coordinate stays the same on this side?”

Answers

1. Plot P(-4, -2), Q(3, -2), R(3, 2), S(-4, 2), then connect P-Q-R-S-P. The result is a rectangle.
2. PQ: x-values -4 and 3; 3 - (-4) = 7 grid units. QR: y-values -2 and 2; 2 - (-2) = 4 grid units. RS: x-values 3 and -4; 3 - (-4) = 7 grid units. SP: y-values 2 and -2; 2 - (-2) = 4 grid units.
3. Perimeter: 7 + 4 + 7 + 4 = 22 grid units.
4. Fence: 22 grid units x 2 meters per grid unit = 44 meters. Accept equivalent correct subtraction order if the student records a positive distance and clear reasoning.

Support and extension

For support, let students trace one horizontal and one vertical side with a ruler before completing the table. For extension, ask students to create a different rectangle with perimeter 22 grid units and list its vertices. Check that opposite sides are horizontal or vertical and that the perimeter is 22 units.