# Farm Tractor Coordinate Picture: Plot Ordered Pairs Across Quadrants

Complete worked example / separate answer key

Plot the points (2, 1), (-2, 1), (-2, -1), and (2, -1) in order, then connect them to form a closed shape. Describe the shape and state its side lengths in grid units.

Answer: The points form a rectangle centered on the origin. The horizontal sides are 4 units long (from x = -2 to x = 2), and the vertical sides are 2 units long (from y = -1 to y = 1). The rectangle crosses both axes.

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Original tasks 1, 2, 3 / complete keys

Task 1

Plot and connect these points in order to form a small wheel: (1, 0), (0, 1), (-1, 0), (0, -1), and back to (1, 0). What shape is formed, and what is its width from left to right in grid units?

Answer: The points form a diamond (a square rotated 45 degrees). Its width from left to right is 2 grid units, from x = -1 to x = 1.

Reason: Each point lies one unit from the origin along an axis. Connecting them in order creates four equal sides. The leftmost point is (-1, 0) and the rightmost is (1, 0), so the horizontal width is 2 units.

Check: Verify that each point is exactly one unit from the origin along an axis. Count squares between (-1, 0) and (1, 0) to confirm the width is 2 units.

Task 2

A tractor body uses these corner points: (-3, 2), (3, 2), (3, -2), and (-3, -2). Plot them in order and connect them. What are the length and height of the body in grid units, and does the shape cross the axes?

Answer: The body is a rectangle 6 units long and 4 units high. It crosses both axes because it extends from x = -3 to x = 3 and from y = -2 to y = 2.

Reason: The horizontal distance between x = -3 and x = 3 is 6 units. The vertical distance between y = -2 and y = 2 is 4 units. Since the rectangle includes positive and negative coordinates, it crosses both axes.

Check: Count squares along the top edge from (-3, 2) to (3, 2) to confirm 6 units. Count squares along the left edge from (-3, 2) to (-3, -2) to confirm 4 units. Check that the origin lies inside the rectangle.

Task 3

Plot the exhaust segment endpoints (-1, 3) and (-1, 5). Then plot a second segment from (1, 3) to (1, 5). Are the two segments parallel, and how far apart are they horizontally in grid units?

Answer: Both segments are vertical and parallel. They are 2 grid units apart horizontally, from x = -1 to x = 1.

Reason: Each segment has the same x-coordinate at both endpoints, so each is vertical. Vertical lines are parallel. The horizontal distance between x = -1 and x = 1 is 2 units.

Check: Confirm that each pair shares an x-coordinate. Count squares between the two vertical lines at the same y-level to verify the 2-unit separation.

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Original tasks 4 / complete keys

Task 4

Plot the points (0, -3), (2, -3), (2, -5), and (0, -5) in order and connect them to form a small wheel. What shape is formed, and what is its area in square grid units?

Answer: The points form a rectangle 2 units wide and 2 units high, so its area is 4 square grid units.

Reason: The x-coordinates range from 0 to 2, giving a width of 2 units. The y-coordinates range from -5 to -3, giving a height of 2 units. A 2-by-2 rectangle has area 4 square units.

Check: Count squares along the top edge from (0, -3) to (2, -3) to confirm 2 units. Count squares along the left edge from (0, -3) to (0, -5) to confirm 2 units. Multiply width by height to check the area.

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Task 1, Task 2 / Practice Task Answers, Reasoning, and Checks

Answers, reasoning, and check methods for all four tasks.

Task 1 answer: The points form a diamond (a square rotated 45 degrees). Its width from left to right is 2 grid units, from x = -1 to x = 1.

Task 1 reasoning: Each point lies one unit from the origin along an axis. Connecting them in order creates four equal sides. The leftmost point is (-1, 0) and the rightmost is (1, 0), so the horizontal width is 2 units.

Task 1 check: Verify that each point is exactly one unit from the origin along an axis. Count squares between (-1, 0) and (1, 0) to confirm the width is 2 units.

Task 2 answer: The body is a rectangle 6 units long and 4 units high. It crosses both axes because it extends from x = -3 to x = 3 and from y = -2 to y = 2.

Task 2 reasoning: The horizontal distance between x = -3 and x = 3 is 6 units. The vertical distance between y = -2 and y = 2 is 4 units. Since the rectangle includes positive and negative coordinates, it crosses both axes.

Task 2 check: Count squares along the top edge from (-3, 2) to (3, 2) to confirm 6 units. Count squares along the left edge from (-3, 2) to (-3, -2) to confirm 4 units. Check that the origin lies inside the rectangle.

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Task 3, Task 4 / Practice Task Answers 3 and 4

Answers, reasoning, and checks for tasks 3 and 4.

Task 3 answer: Both segments are vertical and parallel. They are 2 grid units apart horizontally, from x = -1 to x = 1.

Task 3 reasoning: Each segment has the same x-coordinate at both endpoints, so each is vertical. Vertical lines are parallel. The horizontal distance between x = -1 and x = 1 is 2 units.

Task 3 check: Confirm that each pair shares an x-coordinate. Count squares between the two vertical lines at the same y-level to verify the 2-unit separation.

Task 4 answer: The points form a rectangle 2 units wide and 2 units high, so its area is 4 square grid units.

Task 4 reasoning: The x-coordinates range from 0 to 2, giving a width of 2 units. The y-coordinates range from -5 to -3, giving a height of 2 units. A 2-by-2 rectangle has area 4 square units.

Task 4 check: Count squares along the top edge from (0, -3) to (2, -3) to confirm 2 units. Count squares along the left edge from (0, -3) to (0, -5) to confirm 2 units. Multiply width by height to check the area.

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Worked example / Worked Example Answer

Worked example answer.

The points form a rectangle centered on the origin. The horizontal sides are 4 units long (from x = -2 to x = 2), and the vertical sides are 2 units long (from y = -1 to y = 1). The rectangle crosses both axes.

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Source rubric / reflection

- [ ] All ordered pairs are plotted with correct signs and positions.
- [ ] Points are labeled lightly and consistently.
- [ ] Segments connect the correct points in the given order.
- [ ] Closed shapes close properly; wheels are separate from the body.
- [ ] The scale is stated and used consistently.
- [ ] Valid alternatives are accepted if the plotting convention is stated and followed, including handwritten labels and sketch-style connections.

Reflection: What did you check, what did you change, and what will you try next?