Half-Car Symmetry on Graph Paper: Complete the Mirror Image

Original tasks 1, 2, 3 / complete keys

Task 1

Mirror the points (-4, 2), (-2, 5), and (0, 7) across the vertical axis x = 0. List the mirrored points.

Answer: (4, 2), (2, 5), (0, 7).

Reason: For a vertical axis at x = 0, change the sign of the column only. The row stays the same. The point on the axis mirrors to itself.

Check: Count squares from the axis: each mirrored point must be the same distance from the axis and on the same row as its partner.

Task 2

A left-half outline includes a point at (-3, 4). A student marks the mirror at (3, 5). Explain the error and give the correct point.

Answer: The row was changed. The correct mirror is (3, 4).

Reason: Mirroring across a vertical axis keeps the row unchanged. Only the column sign changes, so (-3, 4) becomes (3, 4).

Check: Compare rows: both points must be on row 4. Count three squares from the axis on each side.

Task 3

The left half has outline points (-6, 1), (-4, 3), (-2, 3), and (0, 5). Mirror them and state the order in which to connect the right-half points.

Answer: Mirrored points: (6, 1), (4, 3), (2, 3), (0, 5). Connect in the order (6, 1) to (4, 3) to (2, 3) to (0, 5), joining at the shared axis point (0, 5).

Reason: Each point mirrors by changing the column sign. The connection order follows the left-half sequence so the outline shape matches.

Check: Verify each pair has equal distance from the axis and the same row, and that the final segment ends at the shared axis point.

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Original tasks 4 / complete keys

Task 4

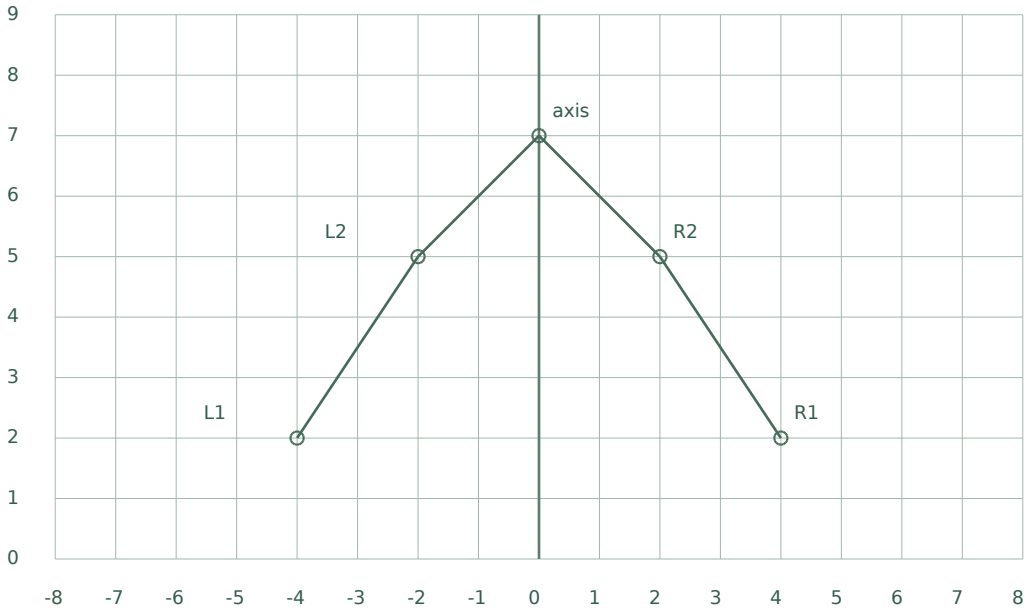
A completed right half has points (2, 3), (4, 3), and (5, 1). The left half has (-2, 3), (-4, 3), and (-5, 1). A checker says the outline is correct. Is the checker right? Give a reason.

Answer: Yes. Each right point is the exact mirror of the corresponding left point: same row and equal distance from the axis.

Reason: The pairs are (-2, 3) with (2, 3), (-4, 3) with (4, 3), and (-5, 1) with (5, 1). All satisfy the mirror rule.

Check: Count squares from the axis for each pair and compare rows. All counts and rows match.

Mirror the supplied partial outline / vertical axis x = 0

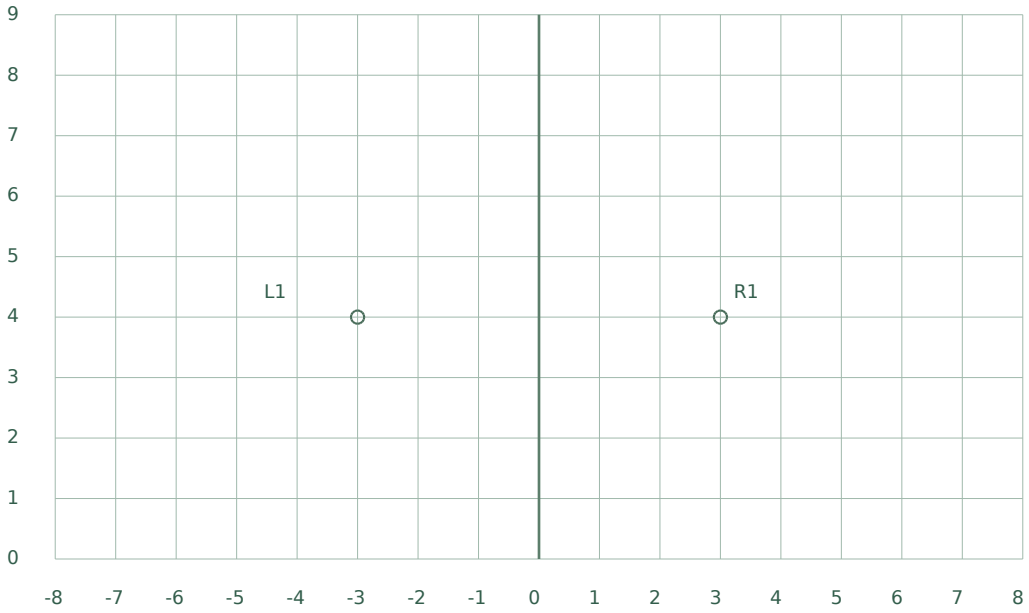


Reflected points: (4, 2), (2, 5), (0, 7)

Reflection rule: (x, y) becomes (-x, y). Preserve the row, equal distance from x = 0 and the original connection order. These are the source-supplied partial car-outline segments, not an invented complete vehicle.

Task 2 / answers

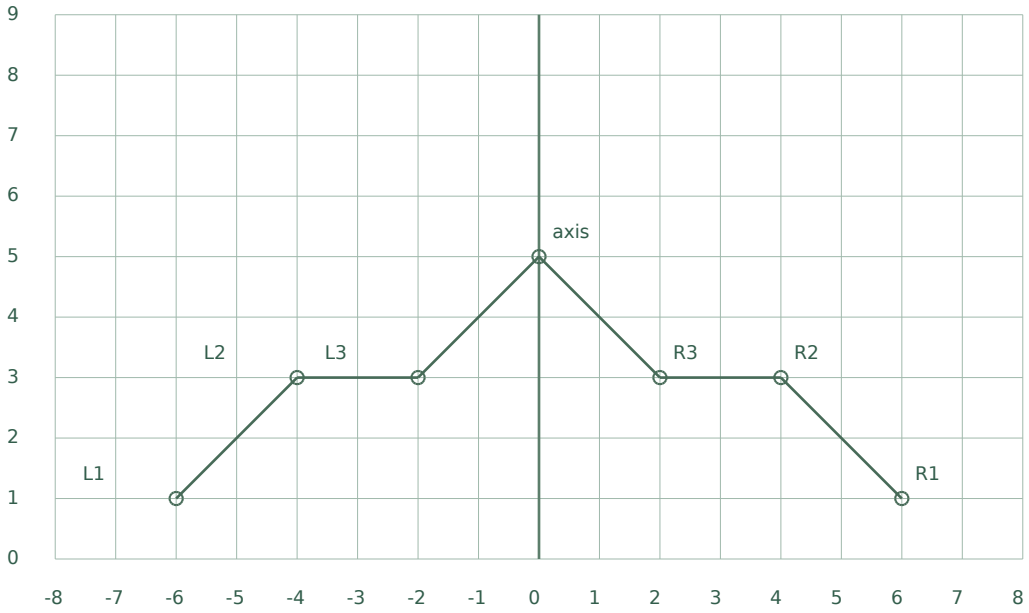
Mirror the supplied partial outline / vertical axis x = 0



Reflected points: (3, 4)

Reflection rule: (x, y) becomes (-x, y). Preserve the row, equal distance from x = 0 and the original connection order. These are the source-supplied partial car-outline segments, not an invented complete vehicle.

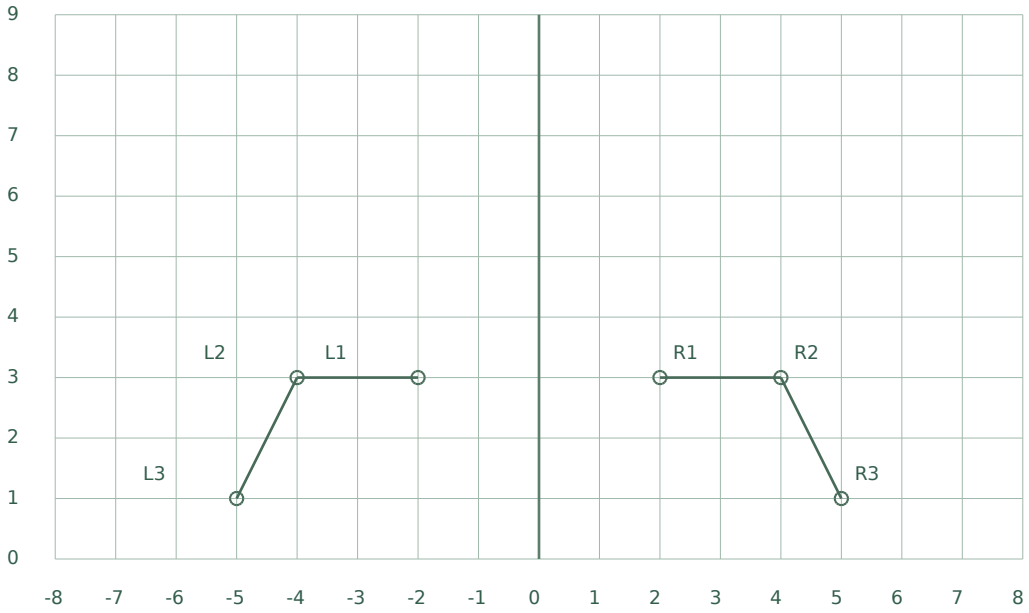
Mirror the supplied partial outline / vertical axis x = 0



Reflected points: (6, 1), (4, 3), (2, 3), (0, 5)

Reflection rule: (x, y) becomes (-x, y). Preserve the row, equal distance from x = 0 and the original connection order. These are the source-supplied partial car-outline segments, not an invented complete vehicle.

Mirror the supplied partial outline / vertical axis x = 0



Reflected points: (2, 3), (4, 3), (5, 1)

Reflection rule: (x, y) becomes (-x, y). Preserve the row, equal distance from x = 0 and the original connection order. These are the source-supplied partial car-outline segments, not an invented complete vehicle.

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Source rubric / reflection

- [ ] All right-half outline points lie on grid intersections.
- [ ] Each right-half point is the exact mirror of its left-half partner: same row, equal distance from the axis.
- [ ] Points on the axis are shared, with no gap or overlap between halves.
- [ ] The right-half outline is connected in the same order and segment pattern as the left half.
- [ ] The completed silhouette is recognisably a car outline and is balanced about the axis.
- [ ] Valid alternative styles are accepted when both halves match under the stated convention.

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