

North Carolina mathematics

Grade 4 | Geometry

Reflect, match and draw symmetry



NC.4.G.3

Teacher scripts • original visual models • 30 choice checks • 30 open/performance tasks • worked keys • observation records

Current NC standards for 2026-27 and 2027-28. Use the selected core across short sessions; the reusable bank is not a single test.

Free sample | Contents

NC.4.G.3 | Fourth Grade mathematics

This sample contains 22 complete selected pages from the 110-page resource, plus this sample contents page. Original printed page numbers are retained. Gaps are intentional.

Included original pages: 1-20, 77-78

Representative activities

M01: sample PDF page(s) 18; original page(s) 17

M02: sample PDF page(s) 20; original page(s) 19

O01: sample PDF page(s) 19; original page(s) 18

O02: sample PDF page(s) 21; original page(s) 20

Selected teacher prompts and keys: original page(s) 77-78

Using this sample

Read the preparation and access guidance before using a selected activity.

Keep teacher keys and private preparation pages separate from student copies.

Use the original resource contents to see the scope of the complete packet.

Complete paid download

The complete resource includes the full PDF task bank and teaching materials.

Contents and planning

Choose a focused lesson

Guide: exact standard, targets, preparation, worked models and seven detailed section scripts. Student resources: reusable organizer and 30 choice plus 30 open/performance tasks. Teacher resources: worked item keys, rubric, evidence record, inquiry and official sources. Use the printed page numbers and item IDs to select copies.

Selected core, not a 60-item test

An 80-minute selected core can be split across three or more sessions. Warm-up 8 min; I Do 12; We Do 15; collaborative practice 13; independent practice 17; small-group reteach 10; exit 5. Use the first M and O in each section; other items provide transfer or later observation. Do not ask learners to complete the whole bank in one sitting.

Section bank allocations: 01-04 warm-up; 05-08 I Do; 09-13 We Do; 14-18 collaborative; 19-23 independent; 24-27 reteach; 28-30 exit. Each range includes both M choice and O performance items. Choice success does not replace actual drawing, measurement or explanation.

Suggested split

Day 1: warm-up, models and shared work. Day 2: partner and individual practice. Day 3: targeted reteach, fresh exit and a later extension. Adjust minutes for access and evidence; times are never scoring cutoffs.

Visual support

Exact symmetric and asymmetric outlines, candidate fold lines and half-figure grids support reflection tests and drawing.

Exact official standard

What learners demonstrate

NC.4.G.3 | Recognize symmetry in a two-dimensional figure, and identify and draw lines of symmetry.

I can targets

A | I can recognize reflection symmetry through matching halves.

B | I can identify all lines of symmetry, including rotated and nonexample figures.

C | I can draw symmetry lines and complete reflected figures.

Essential question

How can matching points prove a line is a reflection line?

Collect the actual drawing or construction, the measurement/calculation when relevant, and the learner's explanation. Targets are instructional descriptions, not official mastery cutoffs.

Preparation and access

Prepare tools, preserve thinking

Materials

Pencils, straightedge/ruler, blank paper and copies of selected pages. Provide tracing paper, a safe classroom mirror or folded paper. Adults handle any cutting; no loose tiny pieces are needed.

Prior learning and limits

Recognize shapes and compare equal lengths. Match locations using a fold or mirror and count grid spaces. Congruence/similarity formal proof and coordinate transformations are not required.

Vocabulary

reflection, mirror line, line of symmetry, matching points, equal distance, fold

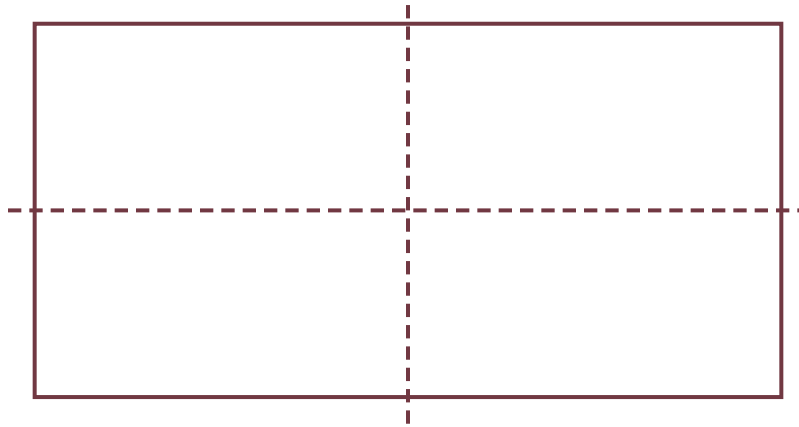
Access without supplying answers

Read prompts and labels neutrally. Allow oral, signed, AAC, drawn or learner-directed responses. A learner may direct an adult's physical marks when motor access is needed, but must choose locations and relationships. Do not place the protractor, identify a symmetry line, select a partition or name a shape for the learner during an independent check. Record physical access separately from mathematical cues. Do not score handwriting, spelling or reading speed.

Teacher-only worked model

Fold means match

A line of reflection symmetry makes the entire figure match itself when reflected across the line. Equal area alone is not enough. A non-square rectangle has two lines of symmetry, through midpoints of opposite sides. Its diagonals are not symmetry lines because adjacent sides have different lengths.



Test the entire outline; a line must match all corresponding points.

Invite evidence

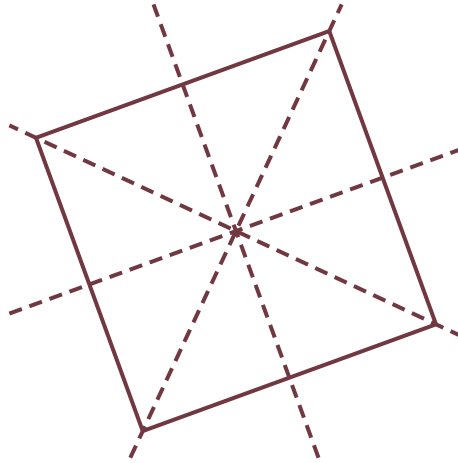
Say: "Show what in the model proves the claim. How could we check it a different way?"
Ask the learner to perform the action, not merely repeat the vocabulary. Hide this completed model for uncued work.

If a diagonal of a non-square rectangle is proposed, trace it and fold or reflect matching corners to expose a mismatch. If half-turn symmetry is confused with reflection, distinguish turning from flipping. If the reflected half is translated, compare distances from the mirror line one corner at a time.

Teacher-only worked model

Turned figures still match

A square has four reflection lines: two through opposite side midpoints and two through opposite vertices. Rotating the square rotates its symmetry lines. A slanted non-square parallelogram has no reflection lines even though a half-turn matches it to itself. Turning and reflecting are different tests.



Test the entire outline; a line must match all corresponding points.

Invite evidence

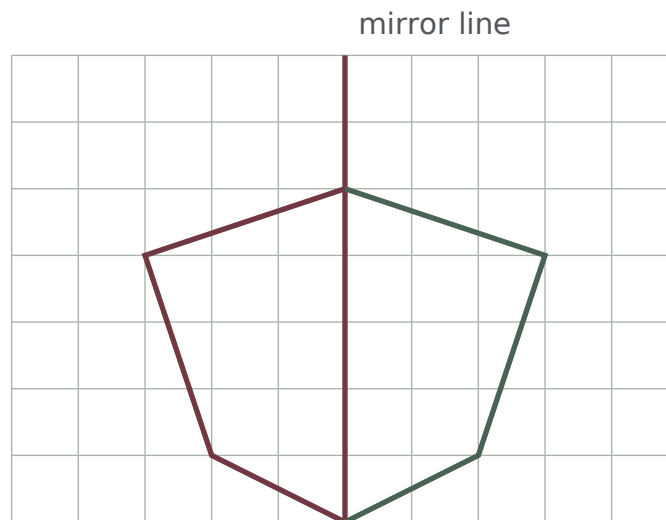
Say: "Show what in the model proves the claim. How could we check it a different way?"
Ask the learner to perform the action, not merely repeat the vocabulary. Hide this completed model for uncued work.

If a diagonal of a non-square rectangle is proposed, trace it and fold or reflect matching corners to expose a mismatch. If half-turn symmetry is confused with reflection, distinguish turning from flipping. If the reflected half is translated, compare distances from the mirror line one corner at a time.

Teacher-only worked model

Complete the reflection

Count grid spaces from each corner to the mirror line, then place its partner the same distance on the other side at the same height. Points on the line stay fixed. Left offsets -2 and -3 become +2 and +3. Connect matching corners in the corresponding order; do not slide the whole outline sideways.



Invite evidence

Say: "Show what in the model proves the claim. How could we check it a different way?"
Ask the learner to perform the action, not merely repeat the vocabulary. Hide this completed model for uncued work.

If a diagonal of a non-square rectangle is proposed, trace it and fold or reflect matching corners to expose a mismatch. If half-turn symmetry is confused with reflection, distinguish turning from flipping. If the reflected half is translated, compare distances from the mirror line one corner at a time.

Teacher script | Warm-up

Warm-up | 8 minutes

Select M01 and O01. Reserve M/O01-04 for transfer or later practice. Target: Identify all lines of symmetry, including rotated and nonexample figures.

0-2 min | launch

Say: "Draw ALL lines of symmetry on this figure. If there are none, write "none." Explain how you checked a possible fold using matching points." Ask the learner to explain what must be found or drawn before choosing a method. Read printed labels without interpreting them.

2-5 min | work and observe

Invite a drawing, physical tool use or calculation. Say: "What feature matters here? Show each step so another person can check." In shared work, compare two proposed methods and test them against the figure.

5-8 min | check and record

Look/listen for: 4 line(s). Directions relative to page horizontal: 45.0° , 135.0° , 90.0° , 0.0° , each through vertex centroid. Check matching reflected corners and full edges. Teacher measures only to verify, not to require angle calculations from learners. Use M01 as a quick recognition check; the performance remains the stronger evidence.

Record item, actual action, explanation, neutral access and mathematical cues separately. Early finishers create a second valid example or a counterexample, then explain why it works.

Teacher script | I Do

I Do | 12 minutes

Select M05 and O05. Reserve M/O05-08 for transfer or later practice. Target: Identify all lines of symmetry, including rotated and nonexample figures.

0-2 min | launch

Say: "Draw ALL lines of symmetry on this figure. If there are none, write "none." Explain how you checked a possible fold using matching points." Ask the learner to explain what must be found or drawn before choosing a method. Read printed labels without interpreting them.

2-9 min | model

Model the selected performance completely: 2 line(s). Directions relative to page horizontal: 1.6° , 91.6° , each through vertex centroid. Check matching reflected corners and full edges. Teacher measures only to verify, not to require angle calculations from learners. Say: "I will check the features in the actual drawing, not trust a label." Invite learners to describe the next step before you take it.

9-12 min | check and record

Look/listen for: 2 line(s). Directions relative to page horizontal: 1.6° , 91.6° , each through vertex centroid. Check matching reflected corners and full edges. Teacher measures only to verify, not to require angle calculations from learners. Use M05 as a quick recognition check; the performance remains the stronger evidence.

Record item, actual action, explanation, neutral access and mathematical cues separately. Early finishers create a second valid example or a counterexample, then explain why it works.

Teacher script | We Do

We Do | 15 minutes

Select M09 and O09. Reserve M/O09-13 for transfer or later practice. Target: Identify all lines of symmetry, including rotated and nonexample figures.

0-2 min | launch

Say: "Draw ALL lines of symmetry on this figure. If there are none, write "none." Explain how you checked a possible fold using matching points." Ask the learner to explain what must be found or drawn before choosing a method. Read printed labels without interpreting them.

2-12 min | work and observe

Invite a drawing, physical tool use or calculation. Say: "What feature matters here? Show each step so another person can check." In shared work, compare two proposed methods and test them against the figure.

12-15 min | check and record

Look/listen for: 0 line(s). None. Demonstrate a mismatch for proposed folds; a non-square parallelogram may have half-turn symmetry but no reflection line. Teacher measures only to verify, not to require angle calculations from learners. Use M09 as a quick recognition check; the performance remains the stronger evidence.

Record item, actual action, explanation, neutral access and mathematical cues separately. Early finishers create a second valid example or a counterexample, then explain why it works.

Teacher script | Collaborative practice

Collaborative practice | 13 minutes

Select M14 and O14. Reserve M/O14-18 for transfer or later practice. Target: Draw symmetry lines and complete reflected figures.

0-2 min | launch

Say: "The bold vertical line is a mirror line. Complete the other half of the outline on the grid. Match every corner at the same height and the same distance from the line. Explain your check." Ask the learner to explain what must be found or drawn before choosing a method. Read printed labels without interpreting them.

2-10 min | work and observe

Partner A performs the task while Partner B checks using the defining features. Switch roles with the next open item. Each learner makes a separate record. Say: "Point to evidence before agreeing with your partner."

10-13 min | check and record

Look/listen for: Given left-half vertices, measured from axis bottom: [(0, 0), (-2, 1), (-3, 3), (0, 4)]. Reflected vertices: [(0, 0), (2, 1), (3, 3), (0, 4)]. Connect in reverse order to close the outline. Corresponding corners have opposite horizontal offsets and equal heights; axis points stay fixed. Observe drawing, not only a statement. Use M14 as a quick recognition check; the performance remains the stronger evidence.

Record item, actual action, explanation, neutral access and mathematical cues separately. Early finishers create a second valid example or a counterexample, then explain why it works.

Teacher script | Independent practice

Independent practice | 17 minutes

Select M19 and O19. Reserve M/O19-23 for transfer or later practice. Target: Identify all lines of symmetry, including rotated and nonexample figures.

0-2 min | launch

Say: "Draw ALL lines of symmetry on this figure. If there are none, write "none." Explain how you checked a possible fold using matching points." Ask the learner to explain what must be found or drawn before choosing a method. Read printed labels without interpreting them.

2-14 min | work and observe

Give quiet time for the learner's own drawing, tool use and explanation. Do not supply a mathematical cue. Say only: "Show your check." Record the original response before any teaching.

14-17 min | check and record

Look/listen for: 1 line(s). Directions relative to page horizontal: 55.0° , each through vertex centroid. Check matching reflected corners and full edges. Teacher measures only to verify, not to require angle calculations from learners. Use M19 as a quick recognition check; the performance remains the stronger evidence.

Record item, actual action, explanation, neutral access and mathematical cues separately. Early finishers create a second valid example or a counterexample, then explain why it works.

Teacher script | Small-group reteach

Small-group reteach | 10 minutes

Select M24 and O24. Reserve M/O24-27 for transfer or later practice. Target: Draw symmetry lines and complete reflected figures.

0-2 min | launch

Say: "The bold vertical line is a mirror line. Complete the other half of the outline on the grid. Match every corner at the same height and the same distance from the line. Explain your check." Ask the learner to explain what must be found or drawn before choosing a method. Read printed labels without interpreting them.

2-7 min | work and observe

If a diagonal of a non-square rectangle is proposed, trace it and fold or reflect matching corners to expose a mismatch. If half-turn symmetry is confused with reflection, distinguish turning from flipping. If the reflected half is translated, compare distances from the mirror line one corner at a time. Use a smaller or simpler fresh example first, then return to O24. Record the amount of support.

7-10 min | check and record

Look/listen for: Given left-half vertices, measured from axis bottom: $[(0, 0), (-3, 2), (-4, 5), (0, 6)]$. Reflected vertices: $[(0, 0), (3, 2), (4, 5), (0, 6)]$. Connect in reverse order to close the outline. Corresponding corners have opposite horizontal offsets and equal heights; axis points stay fixed. Observe drawing, not only a statement. Use M24 as a quick recognition check; the performance remains the stronger evidence.

Record item, actual action, explanation, neutral access and mathematical cues separately. Early finishers create a second valid example or a counterexample, then explain why it works.

Teacher script | Exit ticket

Exit ticket | 5 minutes

Select M28 and O28. Reserve M/O28-30 for transfer or later practice. Target: Draw symmetry lines and complete reflected figures.

0-1 min | launch

Say: "The bold vertical line is a mirror line. Complete the other half of the outline on the grid. Match every corner at the same height and the same distance from the line. Explain your check." Ask the learner to explain what must be found or drawn before choosing a method. Read printed labels without interpreting them.

1-3 min | work and observe

Give quiet time for the learner's own drawing, tool use and explanation. Do not supply a mathematical cue. Say only: "Show your check." Record the original response before any teaching.

3-5 min | check and record

Look/listen for: Given left-half vertices, measured from axis bottom: [(0, 0), (-3, 2), (-4, 4), (0, 5)]. Reflected vertices: [(0, 0), (3, 2), (4, 4), (0, 5)]. Connect in reverse order to close the outline. Corresponding corners have opposite horizontal offsets and equal heights; axis points stay fixed. Observe drawing, not only a statement. Use M28 as a quick recognition check; the performance remains the stronger evidence.

Record item, actual action, explanation, neutral access and mathematical cues separately. Early finishers create a second valid example or a counterexample, then explain why it works.

Reteach and extension

Respond to the evidence

Common misconceptions

If a diagonal of a non-square rectangle is proposed, trace it and fold or reflect matching corners to expose a mismatch. If half-turn symmetry is confused with reflection, distinguish turning from flipping. If the reflected half is translated, compare distances from the mirror line one corner at a time.

Language supports

Use the relevant frame: "I know ___ because the drawing shows ___." "I checked by ___." "My first claim changed because ___." Supply vocabulary or allow a home-language explanation without selecting the mathematical relationship. Pair verbal descriptions with pointing, sketching and gestures.

Extend strategically

Session 1: design a figure with exactly one reflection line and one with none. Trace or fold each to test it. Session 2: a partner tries to find an extra line or a mismatch; revise the design and document why the final symmetry counts hold. Example one-line figure: non-equilateral isosceles triangle; zero-line figure: scalene triangle.

This is a multi-session reasoning investigation. Preserve initial claims, tests and revisions; do not assign a high depth-of-knowledge label just because a task is long.

Student master | copy as needed

Draw, label, explain

Name: _____ Item: _____

The grid cells represent equal units. No centimeter or inch scale is implied.

My labels and reasoning

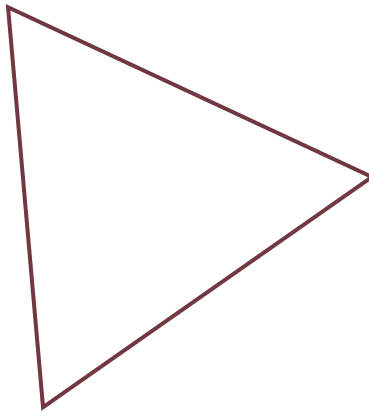
How I checked

Student | Warm-up

M01 | Choose and explain

Name: _____ Date: _____

How many lines of reflection symmetry does this figure have? Imagine folding so the whole boundary matches.



Test the entire outline; a line must match all corresponding points.

- A. 3
- B. 1
- C. 4
- D. 0

Show or tell how you know.

Student | Warm-up

001 | Perform and explain

Name: _____ Date: _____

Draw ALL lines of symmetry on this figure. If there are none, write "none." Explain how you checked a possible fold using matching points.



Test the entire outline; a line must match all corresponding points.

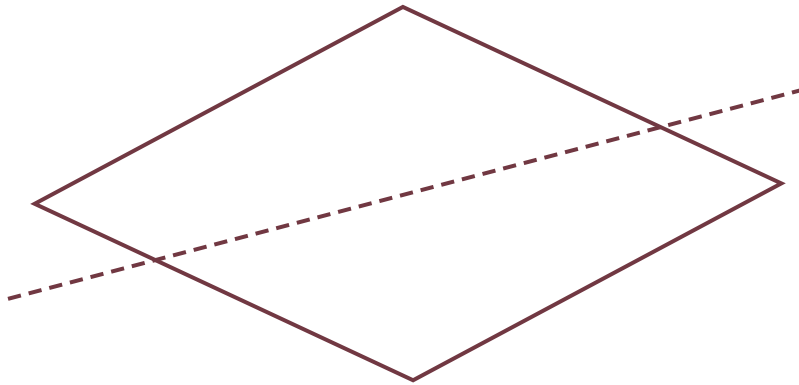
A large, empty rectangular box with a thin black border, intended for the student to draw lines of symmetry or write their explanation.

My reasoning or check (you may tell an adult):

Student | Warm-up

M02 | Choose and explain

Name: _____ Date: _____

Does the dashed line show a line of reflection symmetry?

Test the entire outline; a line must match all corresponding points.

- A. Yes; equal area on each side is enough.
- B. Yes; all boundary points match across the line.
- C. Yes; every line through a shape is a symmetry line.
- D. No; at least one boundary point does not match.

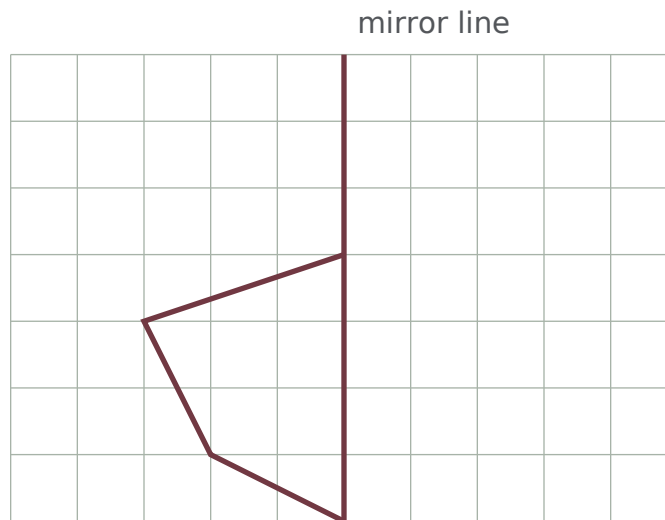
Show or tell how you know.

Student | Warm-up

002 | Perform and explain

Name: _____ Date: _____

The bold vertical line is a mirror line. Complete the other half of the outline on the grid. Match every corner at the same height and the same distance from the line. Explain your check.



My reasoning or check (you may tell an adult):

Teacher-only worked keys

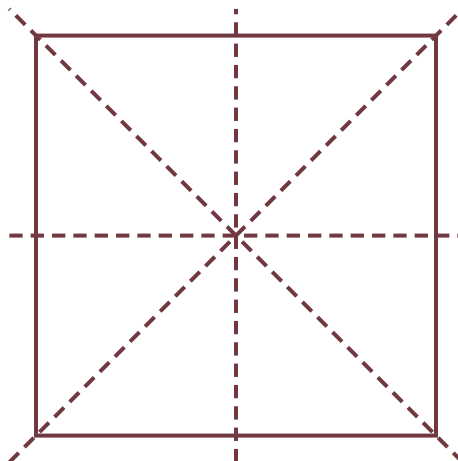
M01 and O01**M01 | A - 3**

Target B | This figure has 3 reflection line(s). Teacher check: directions 65.0° , 5.0° , 125.0° from horizontal through the vertex centroid. Each reflection maps all vertices and edges onto the figure.

Choice check: compare each distractor with the defining attributes or recompute the required quantity. A plausible label or number is insufficient if it contradicts the actual figure. Check the mathematical relationship, not a superficial feature or the order of options.

O01 | Complete sample evidence

Target B | 4 line(s). Directions relative to page horizontal: 45.0° , 135.0° , 90.0° , 0.0° , each through vertex centroid. Check matching reflected corners and full edges. Teacher measures only to verify, not to require angle calculations from learners.



Test the entire outline; a line must match all corresponding points.

Accept mathematically equivalent valid examples and reasoning. Check actual drawing, measurement or tool use; record the learner's evidence and support. The sample is not a required wording script.

Teacher-only worked keys

M02 and O02

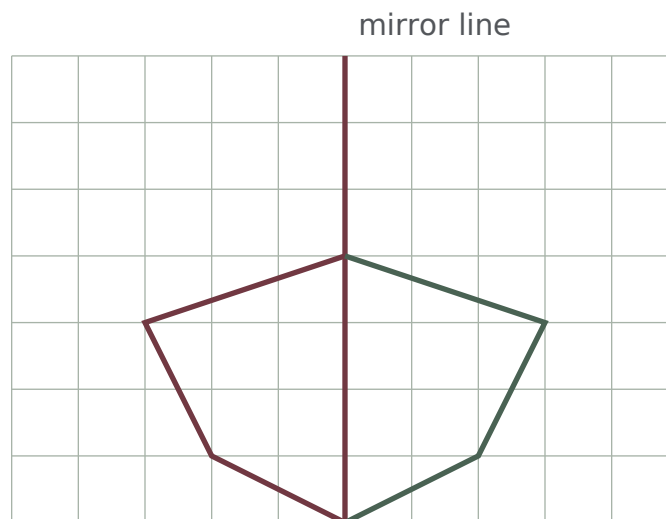
M02 | D - No; at least one boundary point does not match.

Target A | The line does not map the full outline onto itself. A fold must match the entire outline, not merely split area.

Choice check: compare each distractor with the defining attributes or recompute the required quantity. A plausible label or number is insufficient if it contradicts the actual figure. Check the mathematical relationship, not a superficial feature or the order of options.

O02 | Complete sample evidence

Target C | Given left-half vertices, measured from axis bottom: $[(0, 0), (-2, 1), (-3, 3), (0, 4)]$. Reflected vertices: $[(0, 0), (2, 1), (3, 3), (0, 4)]$. Connect in reverse order to close the outline. Corresponding corners have opposite horizontal offsets and equal heights; axis points stay fixed. Observe drawing, not only a statement.



Accept mathematically equivalent valid examples and reasoning. Check actual drawing, measurement or tool use; record the learner's evidence and support. The sample is not a required wording script.