

Coordinate Paths and Distances



Grade 6 | NC.6.NS.8

Teacher scripts and worked models
30 multiple-choice + 30 open/performance tasks
Original number lines, coordinate grids and workspaces
Worked keys, scoring guidance and evidence record

Current North Carolina standards for 2026-27 and 2027-28. Select tasks across several sessions; this bank is not one test.

Free sample | Contents

NC.6.NS.8 | Sixth Grade mathematics

This sample contains 20 complete selected pages from the 107-page resource, plus this sample contents page. Original printed page numbers are retained. Gaps are intentional.

Included original pages: 1-16, 45-46, 75, 90

Representative activities

M01: sample PDF page(s) 16; original page(s) 15

M02: sample PDF page(s) 17; original page(s) 16

O01: sample PDF page(s) 18; original page(s) 45

O02: sample PDF page(s) 19; original page(s) 46

Selected teacher prompts and keys: original page(s) 75, 90

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.

TEACHER GUIDE

Exact standard

Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Alignment note: All clauses above are taught and assessed in this packet. Current NC numbering is used; future 2028-29 standards are not substituted.

TEACHER GUIDE

Targets and coverage

T1: I can graph and interpret real-world and mathematical points in all four quadrants.

Evidence: M02, M09, M20, M23, M30, O04, O05, O07, O14, O16

T2: I can use coordinates and absolute value to find horizontal or vertical distances.

Evidence: M01, M03, M05, M11, M13, M14, M15, M16, M17, M18, M19, M21, M22, M26, M27, O01, O02, O03, O06, O10, O11, O12, O15, O19, O20, O21, O24, O25, O29, O30

T3: I can solve and justify coordinate-route problems.

Evidence: M04, M06, M07, M08, M10, M12, M24, M25, M28, M29, O08, O09, O13, O17, O18, O22, O23, O26, O27, O28

Essential question: How do location, direction and distance help us justify a signed-number statement? MP2 connects contexts and symbols; MP3 critiques reasoning; MP4 models; MP5 chooses tools; MP6 attends to signs and scales.

TEACHER GUIDE

Plan and navigation

Use four sessions of about 25-35 minutes: 1, warm-up and I Do; 2, We Do and collaborative practice; 3, independent work; 4, reteach and exit. Select one choice and one open task per section initially. Keep the other items for spaced practice, conferences and new evidence.

Navigation: exact standard -> targets -> materials -> worked model -> organizer -> seven scripts -> choice bank -> open bank -> worked keys -> evidence and sources. Print selected student pages, not the whole teacher packet.

Warm-up: M01-M04 and O01-O04

I Do: M05-M08 and O05-O08

We Do: M09-M13 and O09-O13

Collaborative practice: M14-M18 and O14-O18

Independent practice: M19-M23 and O19-O23

Small-group reteach: M24-M27 and O24-O27

Exit ticket: M28-M30 and O28-O30

Every item has its own target and worked key. Choice recognition is not a substitute for the plotting, modeling, contextual explanation or justified comparison required in open tasks.

TEACHER GUIDE

Materials and access

Prerequisites: read signed decimals and fractions, identify zero, recognize equal intervals, and describe horizontal/vertical directions. For coordinate tasks, review ordered pairs without teaching the answers to assessment items.

Materials: pencil, ruler, supplied number lines/grids and blank organizers. For integer models, use paper circles with + and - marks or safe classroom counters; the printed model shows how. Adults handle any cutting. No specialized purchased tool is required.

Access: neutral read-aloud, enlargement, high-contrast copy, AAC/signing and dictated explanations are allowed. Preserve the construct: a student must direct placement of each point or model step. A scribe may carry out exact student directions and record them.

Answer-supplying cues include naming the quadrant, reversing the sign for the learner, pointing at the correct location or announcing an operation. Record the first response before a cue and score later supported evidence separately.

Vocabulary: rational number, opposite, additive inverse, zero, absolute value, magnitude, inequality, ordered pair, axis, quadrant, reflection, coordinate, distance, zero pair. Teach only the terms needed for the selected standard.

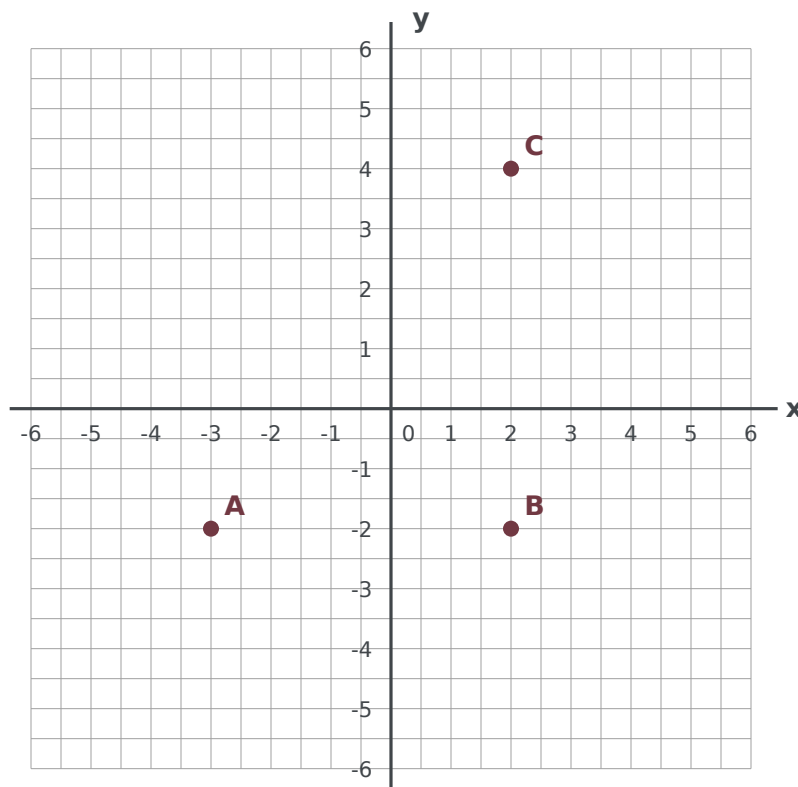
N/O means unobserved, inaccessible or insufficient evidence. Zero means an observed interpretable incorrect response. Do not score handwriting, reading fluency or accent; do not impose invented speed or mastery cutoffs.

Diagrams use mathematical scales, not physical ruler lengths. Each grid has half-unit small squares. Integer lines show 2-unit major ticks with room for student midpoint ticks. Contexts and data are invented for instruction.

WORKED TEACHER MODEL

An axis-aligned journey

$A = (-3, -2)$, $B = (2, -2)$, $C = (2, 4)$. Say: "AB is horizontal because both y-coordinates are -2. $AB = |2 - (-3)| = 5$. BC is vertical because both x-coordinates are 2. $BC = |4 - (-2)| = 6$. The A-B-C route is $5 + 6 = 11$ units. Adding absolute coordinate values works here because each segment crosses zero; it is not the rule for every pair."



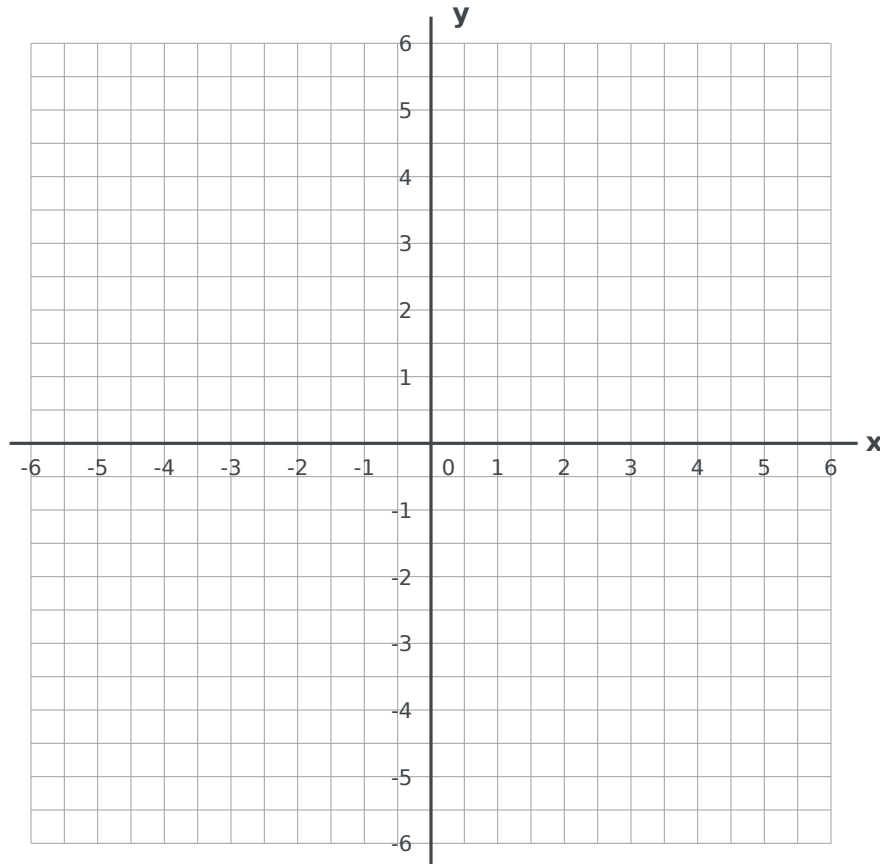
Each small square = 0.5 unit; numbered ticks = 1 unit.

STUDENT TOOL

Reusable reasoning organizer

Name: _____ Date: _____

Situation / given values: _____



Each small square = 0.5 unit; numbered ticks = 1 unit.

Coordinates / fixed coordinate / equation / justification

TEACHER GUIDE

Warm-up script

Core: M01 and O01. Optional bank through M04/O04. Use a fresh item for later independent evidence.

1-3 minutes | Launch

Ask which coordinate stays fixed along a horizontal segment and which stays fixed along a vertical one.

4-8 minutes | Demonstrate or elicit

Say: "Show where you start. What does the sign tell you? What in your representation proves the result?" In I Do, demonstrate the worked model; in We Do, pause for students to supply each step. In independent/exit work, give neutral directions only.

3-6 minutes | Examine

Look for: Use coordinates and absolute value to find horizontal or vertical distances. Ask: "Can you explain the scale, units and meaning of zero?" Check the model before accepting a correct numerical answer.

2-4 minutes | Respond

Document the exact response first. For a sum-of-magnitudes shortcut, compare same-side and opposite-side endpoints. Return to absolute difference. Have the learner retry a different item after instruction; do not erase the distinction between initial and supported evidence.

1-3 minutes | Close

Record the item, representation, reasoning, access supports and any cue. Early finishers create a counterexample to a tempting shortcut and verify it with a model. Each partner provides individual evidence before discussion.

TEACHER GUIDE

I Do script

Core: M05 and O05. Optional bank through M08/O08. Use a fresh item for later independent evidence.

1-3 minutes | Launch

Model the A-B-C route with two separate absolute differences. Contrast a same-side segment such as $x = 2$ to $x = 5$.

4-8 minutes | Demonstrate or elicit

Say: "Show where you start. What does the sign tell you? What in your representation proves the result?" In I Do, demonstrate the worked model; in We Do, pause for students to supply each step. In independent/exit work, give neutral directions only.

3-6 minutes | Examine

Look for: Graph and interpret real-world and mathematical points in all four quadrants. Ask: "Can you explain the scale, units and meaning of zero?" Check the model before accepting a correct numerical answer.

2-4 minutes | Respond

Document the exact response first. For a sum-of-magnitudes shortcut, compare same-side and opposite-side endpoints. Return to absolute difference. Have the learner retry a different item after instruction; do not erase the distinction between initial and supported evidence.

1-3 minutes | Close

Record the item, representation, reasoning, access supports and any cue. Early finishers create a counterexample to a tempting shortcut and verify it with a model. Each partner provides individual evidence before discussion.

TEACHER GUIDE

We Do script

Core: M09 and O09. Optional bank through M13/O13. Use a fresh item for later independent evidence.

1-3 minutes | Launch

Plot first, identify the fixed coordinate, then compute and label the segment distance.

4-8 minutes | Demonstrate or elicit

Say: "Show where you start. What does the sign tell you? What in your representation proves the result?" In I Do, demonstrate the worked model; in We Do, pause for students to supply each step. In independent/exit work, give neutral directions only.

3-6 minutes | Examine

Look for: Solve and justify coordinate-route problems. Ask: "Can you explain the scale, units and meaning of zero?" Check the model before accepting a correct numerical answer.

2-4 minutes | Respond

Document the exact response first. For a sum-of-magnitudes shortcut, compare same-side and opposite-side endpoints. Return to absolute difference. Have the learner retry a different item after instruction; do not erase the distinction between initial and supported evidence.

1-3 minutes | Close

Record the item, representation, reasoning, access supports and any cue. Early finishers create a counterexample to a tempting shortcut and verify it with a model. Each partner provides individual evidence before discussion.

TEACHER GUIDE

Collaborative practice script

Core: M14 and O14. Optional bank through M18/O18. Use a fresh item for later independent evidence.

1-3 minutes | Launch

Partners design an axis-aligned route through four quadrants. Exchange maps and independently check each segment.

4-8 minutes | Demonstrate or elicit

Say: "Show where you start. What does the sign tell you? What in your representation proves the result?" In I Do, demonstrate the worked model; in We Do, pause for students to supply each step. In independent/exit work, give neutral directions only.

3-6 minutes | Examine

Look for: Graph and interpret real-world and mathematical points in all four quadrants. Ask: "Can you explain the scale, units and meaning of zero?" Check the model before accepting a correct numerical answer.

2-4 minutes | Respond

Document the exact response first. For a sum-of-magnitudes shortcut, compare same-side and opposite-side endpoints. Return to absolute difference. Have the learner retry a different item after instruction; do not erase the distinction between initial and supported evidence.

1-3 minutes | Close

Record the item, representation, reasoning, access supports and any cue. Early finishers create a counterexample to a tempting shortcut and verify it with a model. Each partner provides individual evidence before discussion.

TEACHER GUIDE

Independent practice script

Core: M19 and O19. Optional bank through M23/O23. Use a fresh item for later independent evidence.

1-3 minutes | Launch

Use a blank grid. Require labeled points and the expressions that justify the requested distance or route.

4-8 minutes | Demonstrate or elicit

Say: "Show where you start. What does the sign tell you? What in your representation proves the result?" In I Do, demonstrate the worked model; in We Do, pause for students to supply each step. In independent/exit work, give neutral directions only.

3-6 minutes | Examine

Look for: Use coordinates and absolute value to find horizontal or vertical distances. Ask: "Can you explain the scale, units and meaning of zero?" Check the model before accepting a correct numerical answer.

2-4 minutes | Respond

Document the exact response first. For a sum-of-magnitudes shortcut, compare same-side and opposite-side endpoints. Return to absolute difference. Have the learner retry a different item after instruction; do not erase the distinction between initial and supported evidence.

1-3 minutes | Close

Record the item, representation, reasoning, access supports and any cue. Early finishers create a counterexample to a tempting shortcut and verify it with a model. Each partner provides individual evidence before discussion.

TEACHER GUIDE

Small-group reteach script

Core: M24 and O24. Optional bank through M27/O27. Use a fresh item for later independent evidence.

1-3 minutes | Launch

For a sum-of-magnitudes shortcut, compare same-side and opposite-side endpoints. Return to absolute difference.

4-8 minutes | Demonstrate or elicit

Say: "Show where you start. What does the sign tell you? What in your representation proves the result?" In I Do, demonstrate the worked model; in We Do, pause for students to supply each step. In independent/exit work, give neutral directions only.

3-6 minutes | Examine

Look for: Use coordinates and absolute value to find horizontal or vertical distances. Ask: "Can you explain the scale, units and meaning of zero?" Check the model before accepting a correct numerical answer.

2-4 minutes | Respond

Document the exact response first. For a sum-of-magnitudes shortcut, compare same-side and opposite-side endpoints. Return to absolute difference. Have the learner retry a different item after instruction; do not erase the distinction between initial and supported evidence.

1-3 minutes | Close

Record the item, representation, reasoning, access supports and any cue. Early finishers create a counterexample to a tempting shortcut and verify it with a model. Each partner provides individual evidence before discussion.

TEACHER GUIDE

Exit ticket script

Core: M28 and O28. Optional bank through M30/O30. Use a fresh item for later independent evidence.

1-3 minutes | Launch

Ask for a plotted route and a justified distance. Distinguish route length from a direct diagonal.

4-8 minutes | Demonstrate or elicit

Say: "Show where you start. What does the sign tell you? What in your representation proves the result?" In I Do, demonstrate the worked model; in We Do, pause for students to supply each step. In independent/exit work, give neutral directions only.

3-6 minutes | Examine

Look for: Solve and justify coordinate-route problems. Ask: "Can you explain the scale, units and meaning of zero?" Check the model before accepting a correct numerical answer.

2-4 minutes | Respond

Document the exact response first. For a sum-of-magnitudes shortcut, compare same-side and opposite-side endpoints. Return to absolute difference. Have the learner retry a different item after instruction; do not erase the distinction between initial and supported evidence.

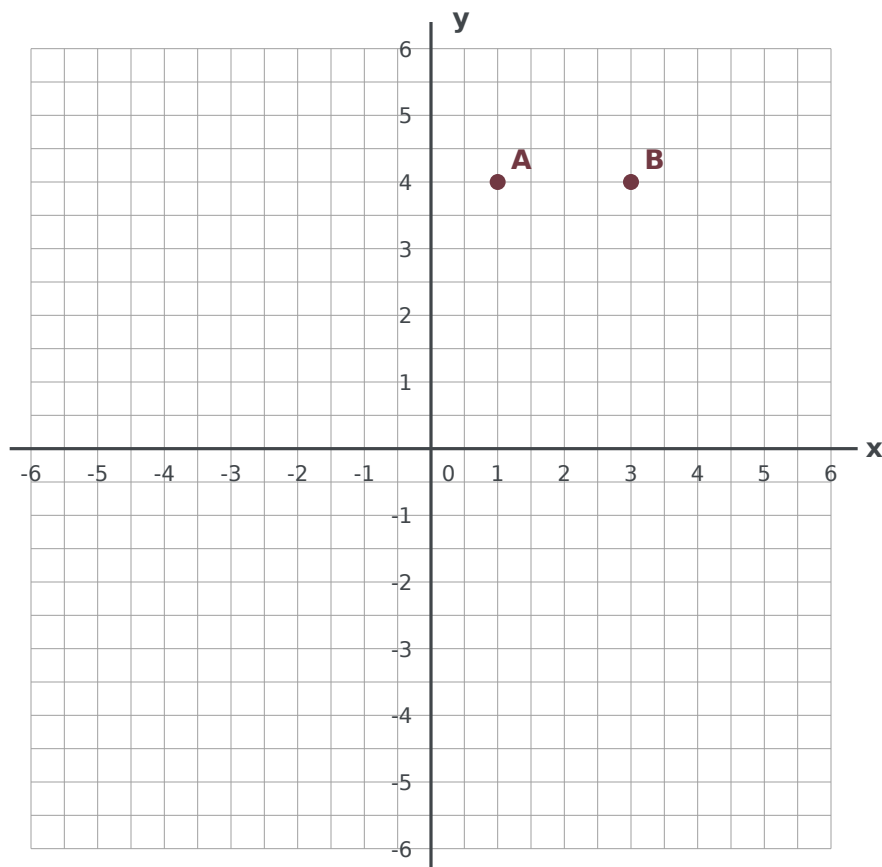
1-3 minutes | Close

Record the item, representation, reasoning, access supports and any cue. Early finishers create a counterexample to a tempting shortcut and verify it with a model. Each partner provides individual evidence before discussion.

STUDENT CHOICE

M01 | Warm-up

A map uses blocks. $A = (1, 4)$, $B = (3, 4)$. What is the distance from A to B?



Each small square = 0.5 unit; numbered ticks = 1 unit.

A. 3

B. 2.5

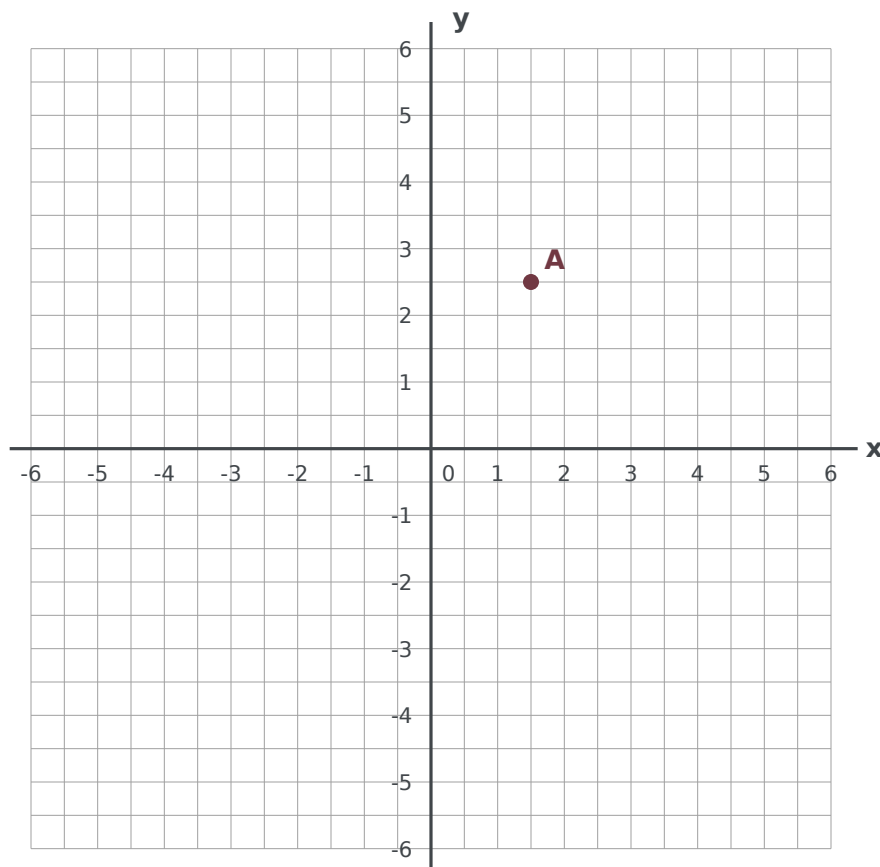
C. 4

D. 2

STUDENT CHOICE

M02 | Warm-up

A rover starts at A (1.5, 2.5). It moves 2 units east with no north-south motion. Where does it stop?



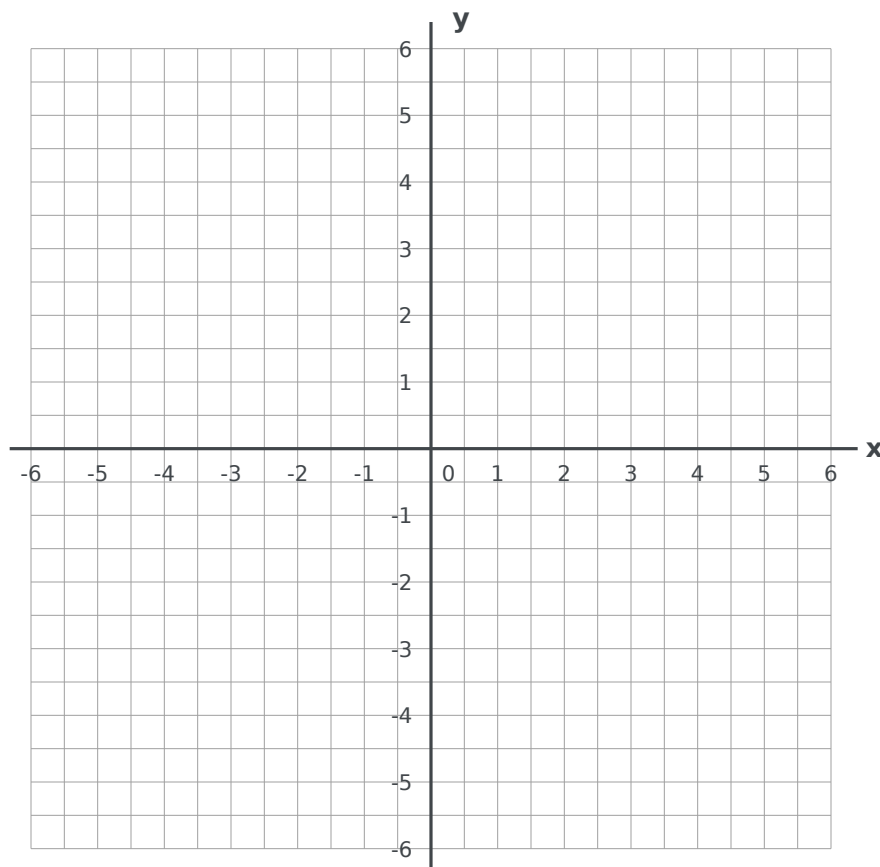
Each small square = 0.5 unit; numbered ticks = 1 unit.

- A. (3.5, 2.5) B. (-0.5, 2.5)
- C. (2.5, 3.5) D. (1.5, 0.5)

STUDENT PERFORMANCE

001 | Warm-up

A map uses blocks. $A = (-2, -5)$, $B = (-2.5, -5)$. What is the distance from A to B? Plot and label every point on the blank grid; draw the segment(s) or trail. Show absolute-value expressions, label units and explain why your method fits the route.



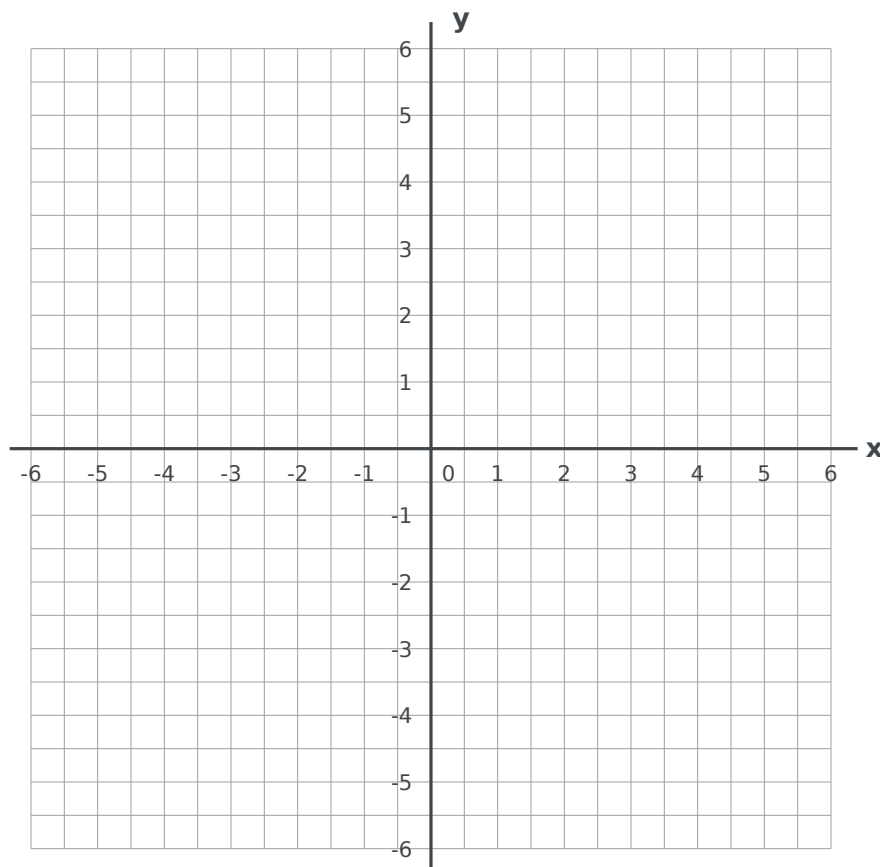
Each small square = 0.5 unit; numbered ticks = 1 unit.

Equations / interpretation / explanation

STUDENT PERFORMANCE

002 | Warm-up

$P = (-4.5, -3.5)$ and $Q = (3, -3.5)$. Which method gives the distance? Plot and label every point on the blank grid; draw the segment. Show an absolute-value expression, label coordinate units and explain why your method fits the segment.



Each small square = 0.5 unit; numbered ticks = 1 unit.

Equations / interpretation / explanation

TEACHER ONLY

M worked keys 1-2

M01: D. 2

Target: Use coordinates and absolute value to find horizontal or vertical distances.

Same second coordinate 4 means horizontal. Distance = $|3 - (1)| = |2| = 2$ blocks.

Distractor checks: 3: Check which coordinate is fixed; compute each required absolute difference once. A route total must include exactly the requested segments. 2.5: Check which coordinate is fixed; compute each required absolute difference once. A route total must include exactly the requested segments. 4: Check which coordinate is fixed; compute each required absolute difference once. A route total must include exactly the requested segments.

M02: A. (3.5, 2.5)

Target: Graph and interpret real-world and mathematical points in all four quadrants.

Only x changes: $1.5 + (2) = 3.5$. Keep $y = 2.5$. Endpoint = $(3.5, 2.5)$; distance = $|3.5 - (1.5)| = 2$ units.

Distractor checks: $(-0.5, 2.5)$: Check which coordinate is fixed; compute each required absolute difference once. A route total must include exactly the requested segments. $(2.5, 3.5)$: Check which coordinate is fixed; compute each required absolute difference once. A route total must include exactly the requested segments. $(1.5, 0.5)$: Check which coordinate is fixed; compute each required absolute difference once. A route total must include exactly the requested segments.

TEACHER ONLY

0 worked keys 1-2

001: 0.5

Target: Use coordinates and absolute value to find horizontal or vertical distances.

Same second coordinate -5 means horizontal. Distance = $|-2.5 - (-2)| = |-0.5| = 0.5$ blocks. A correct graph preserves both coordinates; horizontal segments hold y fixed and vertical segments hold x fixed.

Look for the actual labeled model and an independently given explanation. Accept equivalent correct representations and contexts. A correct answer without the requested performance is incomplete evidence.

002: same y-coordinate; subtract x-coordinates and take absolute value

Target: Use coordinates and absolute value to find horizontal or vertical distances.

The points share $y = -3.5$ but have different x-values. Distance = $|3 - (-4.5)| = 7.5$ coordinate units.

Look for the actual labeled model and an independently given explanation. Accept equivalent correct representations and contexts. A correct answer without the requested performance is incomplete evidence.