Detailed teacher answer key

55 practice questions
Worked answers and feedback

Use with the separate student practice packet. Entries are labeled by the student packet page number (pages 6-60), title, standard and DOK.

Dates stay blank for students to enter as directed by their teacher. Original questions retain the NJGPA-A released-practice alignment. The student cover also lists the four NJSLA-A Geometry reporting categories.

Scoring guidance

For test-style items, check the requested response first. Use the worked explanation to identify misconceptions and give feedback. Classroom explanations support learning; they do not imply an official extended-response test requirement.

DOK 4 tasks are extended classroom investigations. Use the suggested 8-point rubric in this key across multiple sessions; it is not an NJDOE test-scoring rubric.

Strategy: Read the whole question before choosing a method.

Teacher key | Student practice page 6

Dilate a triangle

Standard: G.SRT.A.1 | DOK 2 | Big Ideas / NGL 2025: 4.5; 8.1

Question

Triangle ABC has A(2, 1), B(6, 1), C(2, 4). Dilate it by 3/2 about the origin. Enter the six coordinates of A′, B′ and C′ in the spaces you label below.

Answer and reasoning

A′(3, 1.5), B′(9, 1.5), C′(3, 6).

Use (x, y) → (1.5x, 1.5y). A: (2 × 1.5, 1 × 1.5) = (3, 1.5). B: (6 × 1.5, 1 × 1.5) = (9, 1.5). C: (2 × 1.5, 4 × 1.5) = (3, 6). Multiply both coordinates; do not add 1.5.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 16 - same standard.

Strategy: Label your diagram with the information you are given.

Teacher key | Student practice page 7

Find a dilation scale factor

Standard: G.SRT.A.1 | DOK 1 | Big Ideas / NGL 2025: 4.5

Question

A dilation centered at the origin maps P(2, 4) to P′(5, 10). Enter the scale factor.

Answer and reasoning

2.5. Each coordinate is multiplied by 5/2.

Identify the center and scale factor first. Compare image length to original length. Apply the same factor to corresponding distances from the center; angle measures stay the same. Verify the result with a second corresponding length.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 16 - same standard.

Strategy: Check whether your answer needs units or square/cubic units.

Teacher key | Student practice page 8

Recognize similar figures

Standard: G.SRT.A.2 | DOK 1 | Big Ideas / NGL 2025: 4.6; 8.1

Question

A triangle has side lengths 3, 4, and 5. Which set of lengths describes a similar triangle? Select one answer.

A. 4, 5, 6
B. 6, 8, 10
C. 6, 8, 12
D. 3, 4, 6

Answer and reasoning

B. All corresponding lengths are multiplied by 2.

Identify corresponding vertices and sides before calculating. For similarity, justify the relationship using AA, SAS or SSS as appropriate. For a right triangle, label opposite, adjacent and hypotenuse relative to the stated angle, then choose the matching ratio. Check the result using that same correspondence.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 16 - related skill; standard differs.

Motivation: A corrected mistake is evidence of learning.

Teacher key | Student practice page 9

Rotate a regular polygon

Standard: G.CO.A.3 | DOK 1 | Big Ideas / NGL 2025: 4.3

Question

A regular pentagon is centered at O. Which is the smallest positive rotation about O that maps the pentagon onto itself? Select one answer.

A. 36°
B. 72°
C. 90°
D. 144°

Answer and reasoning

B. 360° ÷ 5 = 72°.

Use the definition, symmetry, correspondence or rigid-motion rule named in the question. A rigid motion preserves lengths and angles. For a sequence, apply each operation in the stated order. Check each selected statement against the given figure or rule.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 21 - same standard.

Strategy: State the theorem or relationship that supports your reasoning.

Teacher key | Student practice page 10

Graph a transformation sequence

Standard: G.CO.A.5 | DOK 2 | Big Ideas / NGL 2025: 4.1–4.4

Question

A triangle has vertices (1, 1), (4, 1), (1, 3). Reflect it across the y-axis, then translate it 5 units right and 2 units down. Plot and connect the three final vertices on the grid.

Answer and reasoning

Final vertices: (4, −1), (1, −1), (4, 1).

Reflect first: (1,1) → (−1,1), (4,1) → (−4,1), (1,3) → (−1,3). Then apply (x,y) → (x+5,y−2). The results are (4,−1), (1,−1), (4,1). Plot all three and connect them in matching order. The combined rule is (x,y) → (5−x,y−2).

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 14 - related skill; standard differs.

Strategy: Keep exact values until a question asks you to round.

Teacher key | Student practice page 11

Dilate from a given center

Standard: G.SRT.A.1 | DOK 2 | Big Ideas / NGL 2025: 4.5

Question

A dilation has center C(1, −2) and scale factor 2. Point P(4, 0) maps to P′. Select P′.

A. (8, 0)
B. (6, 4)
C. (7, 2)
D. (5, −2)

Answer and reasoning

C. $C + 2(P - C) = (7, 2)$.

Subtract the center: $P-C = (4-1, 0-(-2)) = (3,2)$. Double that vector: (6,4). Add the center back: $(1,-2)+(6,4) = (7,2)$. Doubling the original coordinates would incorrectly assume the center is the origin.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 16 - same standard.

Strategy: Use a sketch to make a geometric relationship visible.

Teacher key | Student practice page 12

Identify a trigonometric ratio

Standard: G.SRT.C.6 | DOK 1 | Big Ideas / NGL 2025: 9.4–9.5

Question

In a right triangle, the side opposite acute angle θ is 5 and the hypotenuse is 13. Select the value of sin θ.

A. 5/13
B. 12/13
C. 5/12
D. 13/5

Answer and reasoning

A. sin θ = opposite/hypotenuse = 5/13.

Identify corresponding vertices and sides before calculating. For similarity, justify the relationship using AA, SAS or SSS as appropriate. For a right triangle, label opposite, adjacent and hypotenuse relative to the stated angle, then choose the matching ratio. Check the result using that same correspondence.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 7 - related skill; standard differs.

Motivation: Focus on the next useful step, even when a problem feels difficult.

Teacher key | Student practice page 13

Evaluate similarity information

Standard: G.SRT.B.5 | DOK 3 | Big Ideas / NGL 2025: 8.2–8.3

Question

A designer must establish similarity before using a scale drawing. Triangle ABC has AB = 6, AC = 9, and ∠A = 50°. Select ALL sets of information about triangle DEF that are sufficient to establish ABC ~ DEF in the listed order.

A. DE = 4, DF = 6, and ∠D = 50°
B. DE = 4, DF = 6, and ∠E = 50°
C. ∠D = 50° and ∠E = ∠B
D. DE = 4 and DF = 6 only

Answer and reasoning

A and C. A gives proportional sides around the equal included angle (SAS); C gives two pairs of corresponding equal angles (AA). B has nonincluded equal angles and is insufficient; D lacks angle information and is insufficient.

Identify corresponding vertices and sides before calculating. For similarity, justify the relationship using AA, SAS or SSS as appropriate. For a right triangle, label opposite, adjacent and hypotenuse relative to the stated angle, then choose the matching ratio. Check the result using that same correspondence.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 12 - same standard.

Strategy: Check that your answer satisfies every condition in the question.

Teacher key | Student practice page 14

Find a corresponding side

Standard: G.SRT.B.5 | DOK 2 | Big Ideas / NGL 2025: 8.1; 8.4

Question

Triangles ABC and DEF are similar with A ↔ D, B ↔ E, and C ↔ F. AB = 8, BC = 10, DE = 12. Enter EF.

Answer and reasoning

15. The scale factor is 12/8 = 1.5, so EF = 10(1.5).

Identify corresponding vertices and sides before calculating. For similarity, justify the relationship using AA, SAS or SSS as appropriate. For a right triangle, label opposite, adjacent and hypotenuse relative to the stated angle, then choose the matching ratio. Check the result using that same correspondence.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 12 - same standard.

Strategy: Estimate first so you can judge whether your result is reasonable.

Teacher key | Student practice page 15

Find a proportional segment

Standard: G.SRT.B.5 | DOK 2 | Big Ideas / NGL 2025: 8.4

Question

In triangle ABC, D lies on AB and E lies on AC with DE parallel to BC. AD = 6, DB = 3, AE = 8. Select EC.

A. 4
B. 6
C. 12
D. 16

Answer and reasoning

A. 6/9 = 8/(8 + EC), giving EC = 4.

AB = AD+DB = 9. Since DE ∥ BC, triangles ADE and ABC are similar. Set AD/AB = AE/AC: 6/9 = 8/(8+EC). Cross multiply: 6(8+EC)=72; 48+6EC=72; EC=4. Use corresponding whole sides consistently.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 12 - same standard.

Motivation: Confidence grows through practice, feedback, and another try.

Teacher key | Student practice page 16

Enter a perpendicular equation

Standard: G.GPE.B.5 | DOK 2 | Big Ideas / NGL 2025: 3.5

Question

A line passes through (−2, 1) and (4, 4). Enter the equation, in slope-intercept form, of its perpendicular line through (2, −1).

Answer and reasoning

y = −2x + 3.

Original slope = (4−1)/(4−(−2)) = 3/6 = 1/2. A perpendicular line has slope −2. Substitute (2,−1) into y=−2x+b: −1=−4+b, so b=3. Check: −2(2)+3=−1; the slopes multiply to −1.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 29 - same standard.

Strategy: Compare your final answer with what the question actually asks.

Teacher key | Student practice page 17

Select congruent parts

Standard: G.CO.B.7 | DOK 1 | Big Ideas / NGL 2025: 4.4; 5.2

Question

A rigid motion maps triangle ABC onto DEF with A → D, B → E, C → F. Select ALL statements that must be true.

A. AB = DE
B. AB = EF
C. ∠C = ∠F
D. ∠A = ∠E
E. BC = EF

Answer and reasoning

A, C and E. Corresponding side and angle measures are preserved.

Use the definition, symmetry, correspondence or rigid-motion rule named in the question. A rigid motion preserves lengths and angles. For a sequence, apply each operation in the stated order. Check each selected statement against the given figure or rule.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 27 - same standard.

Strategy: Read the whole question before choosing a method.

Investigate indirect measurement

Standard: G.SRT.B.5 | DOK 4 | Big Ideas / NGL 2025: 8.3–8.4

Question

Extended investigation: How reliably can shadow measurements estimate a tall object's height? Across at least two sessions, collect or obtain real measurements for three pole/shadow or object/shadow pairs on level ground. Record measurement conditions. Develop and justify a similar-triangle model, compare estimates with a known height or a second measurement method, and analyze sources of error. Revise the procedure, test it again, and present a supported conclusion with data. Use this page to plan; attach the investigation record.

Answer and reasoning

Responses vary. Look for a valid AA/similarity argument; recorded real measurements and units; correctly set proportions; a comparison with a known height or independent method; error analysis; a revised procedure and second test; and a conclusion supported by evidence. Do not award full credit for a single proportion without investigation.

Suggested classroom rubric (8 points):
• Model and justification (0-2): correct similarity or trigonometric relationships, with clear assumptions.
• Evidence and calculations (0-2): required measurements, correct calculations, units and comparisons.
• Evaluation and revision (0-2): analyze error or limitations, revise the method/design and retest.
• Conclusion and communication (0-2): a clear claim supported by the recorded results.
Award 2 for complete and accurate evidence, 1 for partial evidence, and 0 for missing or incorrect evidence in each category. A one-session calculation alone does not complete the investigation.

Alignment reference: Classroom extension; not a released-item format.

Strategy: Label your diagram with the information you are given.

Teacher key | Student practice page 19

Choose a construction step

Standard: G.CO.D.12 | DOK 1 | Big Ideas / NGL 2025: 1.2; 6.1

Question

Equal-radius arcs centered at A and B intersect at points X and Y on opposite sides of segment AB. Which next step constructs the perpendicular bisector of AB? Select one answer.

A. Draw AX
B. Draw line XY
C. Draw AB
D. Draw a circle centered at X

Answer and reasoning

B. Join the two arc intersections.

Name the construction goal and identify what each compass arc preserves. Explain why the selected step produces the required equal distances or angles. A drawing that only looks correct is not enough; use the construction relationships to justify it.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 10 - related skill; standard differs.

Strategy: Check whether your answer needs units or square/cubic units.

Teacher key | Student practice page 20

Match a similarity sequence

Standard: G.SRT.A.2 | DOK 2 | Big Ideas / NGL 2025: 4.5–4.6

Question

ABC has A(0,0), B(2,0), C(0,3). DEF has D(4,1), E(8,1), F(4,7). Select the sequence that maps ABC onto DEF.

A. Dilate by 2 about the origin; translate by (4,1).
B. Translate by (4,1); dilate by 2 about the origin.
C. Dilate by 1/2 about the origin; translate by (4,1).
D. Reflect across the y-axis; translate by (4,1).

Answer and reasoning

A. Scale by 2, then add (4,1).

Identify corresponding vertices and sides before calculating. For similarity, justify the relationship using AA, SAS or SSS as appropriate. For a right triangle, label opposite, adjacent and hypotenuse relative to the stated angle, then choose the matching ratio. Check the result using that same correspondence.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 16 - related skill; standard differs.

Motivation: A corrected mistake is evidence of learning.

Teacher key | Student practice page 21

Use a right-triangle ratio

Standard: G.SRT.C.6 | DOK 2 | Big Ideas / NGL 2025: 9.3–9.5

Question

Two right triangles share acute angle θ. In the smaller, the opposite leg is 5 and the hypotenuse is 13. The larger has hypotenuse 39. Enter its opposite leg.

Answer and reasoning

15, from the common ratio 5/13.

The common acute angle and right angles establish AA similarity. Scale factor = 39/13 = 3. The matching opposite side is 5 × 3 = 15. Equivalently x/39 = 5/13.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 7 - related skill; standard differs.

Strategy: State the theorem or relationship that supports your reasoning.

Order a construction

Standard: G.CO.D.12 | DOK 2 | Big Ideas / NGL 2025: 1.5

Question

An angle is copied onto ray PQ. Step 1: draw an arc centered at the original vertex crossing both sides. Step 2: with the same radius, draw an arc centered at P crossing PQ at R. Which pair correctly gives the next two steps? Select one answer.

A. Draw PR; double the compass width.

B. Transfer the distance between the original arc intersections; draw the ray from P through the transferred point.

C. Bisect the original angle; draw a circle at Q.

D. Measure PQ; draw a perpendicular at Q.

Answer and reasoning

B. Transfer the original arc’s chord length onto the new arc, then draw the new side.

Name the construction goal and identify what each compass arc preserves. Explain why the selected step produces the required equal distances or angles. A drawing that only looks correct is not enough; use the construction relationships to justify it.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 10 - related skill; standard differs.

Strategy: Keep exact values until a question asks you to round.

Complete a similarity proof

Standard: G.SRT.B.5 | DOK 3 | Big Ideas / NGL 2025: 8.2–8.4

Question

D lies on AB and E lies on AC in triangle ABC, with DE parallel to BC. A proof uses ∠A common to both triangles and ∠ADE = ∠ABC. Select ALL conclusions justified by that information.

A. Triangle ADE is similar to triangle ABC.

B. Triangle ADE is similar to triangle ACB.

C. AD/AB = AE/AC

D. DE/BC = AD/AB

E. Triangle ADE is necessarily congruent to triangle ABC.

Answer and reasoning

A, C and D. AA gives ADE ~ ABC in matching order; corresponding side ratios and the common scale factor follow. B reverses the vertex correspondence; E states congruence without equal size.

Identify corresponding vertices and sides before calculating. For similarity, justify the relationship using AA, SAS or SSS as appropriate. For a right triangle, label opposite, adjacent and hypotenuse relative to the stated angle, then choose the matching ratio. Check the result using that same correspondence.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 12 - same standard.

Strategy: Use a sketch to make a geometric relationship visible.

Use complementary ratios

Standard: G.SRT.C.7 | DOK 1 | Big Ideas / NGL 2025: 9.5

Question

For an acute angle θ, sin θ = 0.8. Enter cos(90° − θ).

Answer and reasoning

0.8, using the cofunction relationship.

Identify corresponding vertices and sides before calculating. For similarity, justify the relationship using AA, SAS or SSS as appropriate. For a right triangle, label opposite, adjacent and hypotenuse relative to the stated angle, then choose the matching ratio. Check the result using that same correspondence.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 7 - related skill; standard differs.

Motivation: Focus on the next useful step, even when a problem feels difficult.

Teacher key | Student practice page 25

Calculate a building height

Standard: G.SRT.C.8 | DOK 2 | Big Ideas / NGL 2025: 9.4–9.6

Question

An instrument 1.5 m above level ground is 24 m horizontally from a building. The roof’s angle of elevation is 38°. Enter the building’s height to the nearest tenth of a meter.

Answer and reasoning

20.3 m, from 24 tan 38° + 1.5.

The vertical rise above the instrument is opposite the 38° angle; the horizontal distance 24 m is adjacent. tan 38° = rise/24, so rise = 24 tan 38° ≈ 18.7509 m. Add instrument height: 18.7509+1.5 = 20.2509 m, which rounds to 20.3 m. Use degree mode and round only at the end.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 7 - same standard.

Strategy: Check that your answer satisfies every condition in the question.

Teacher key | Student practice page 26

Find an image distance

Standard: G.SRT.A.1 | DOK 1 | Big Ideas / NGL 2025: 4.5

Question

A dilation with scale factor 3/4 maps segment AB of length 20 cm to A′B′. Enter the length of A′B′ in centimeters.

Answer and reasoning

15. Multiply 20 by 3/4.

Identify the center and scale factor first. Compare image length to original length. Apply the same factor to corresponding distances from the center; angle measures stay the same. Verify the result with a second corresponding length.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 16 - same standard.

Strategy: Estimate first so you can judge whether your result is reasonable.

Connect complementary angles

Standard: G.SRT.C.7 | DOK 1 | Big Ideas / NGL 2025: 9.5

Question

An acute angle θ satisfies sin θ = 0.6. What is cos(90° − θ)? Select one answer.

A. 0.4
B. 0.6
C. 0.8
D. 1.0

Answer and reasoning

B. cos(90° − θ) = sin θ = 0.6.

Identify corresponding vertices and sides before calculating. For similarity, justify the relationship using AA, SAS or SSS as appropriate. For a right triangle, label opposite, adjacent and hypotenuse relative to the stated angle, then choose the matching ratio. Check the result using that same correspondence.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 7 - related skill; standard differs.

Motivation: Confidence grows through practice, feedback, and another try.

Teacher key | Student practice page 28

Investigate similarity in design

Standard: G.SRT.A.2 | DOK 4 | Big Ideas / NGL 2025: 4.5–4.6; 8.1

Question

Classroom extension - DOK 4: Over multiple sessions, investigate whether three versions of a school logo are truly similar. Collect original and resized images, record corresponding measurements, and test ratios and angle preservation. Create one intentionally distorted version as a counterexample. Develop a transformation description for a valid version, critique the limitations of measurement evidence, and revise your resizing procedure. Attach images, data, a justification and the revised result.

Answer and reasoning

Responses vary. Require three measured versions, consistent corresponding ratios and angle checks, a distortion counterexample, a valid similarity transformation, limits of measurement evidence, and a tested revision. This is an extended classroom investigation, not a released-test format.

Suggested classroom rubric (8 points):
• Model and justification (0-2): correct similarity or trigonometric relationships, with clear assumptions.
• Evidence and calculations (0-2): required measurements, correct calculations, units and comparisons.
• Evaluation and revision (0-2): analyze error or limitations, revise the method/design and retest.
• Conclusion and communication (0-2): a clear claim supported by the recorded results.
Award 2 for complete and accurate evidence, 1 for partial evidence, and 0 for missing or incorrect evidence in each category. A one-session calculation alone does not complete the investigation.

Alignment reference: Classroom extension; not a released-item format.

Strategy: Compare your final answer with what the question actually asks.

Use a precise definition

Standard: G.CO.A.1 | DOK 1 | Big Ideas / NGL 2025: 1.1; 1.5–1.6

Question

Which statement precisely describes the perpendicular bisector of a segment? Select one answer.

A. Any line that crosses the segment
B. Any line through an endpoint at 90°
C. A line through the midpoint at 90° to the segment
D. Any line parallel to the segment

Answer and reasoning

C. It passes through the midpoint and forms a right angle with the segment.

Use the definition, symmetry, correspondence or rigid-motion rule named in the question. A rigid motion preserves lengths and angles. For a sequence, apply each operation in the stated order. Check each selected statement against the given figure or rule.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Blueprint supplement; no exact released-practice match.

Strategy: Read the whole question before choosing a method.

Teacher key | Student practice page 30

Evaluate dilation claims

Standard: G.SRT.A.1 | DOK 3 | Big Ideas / NGL 2025: 4.5

Question

For each statement, enter T (always true) or F (not always true). A dilation has center O and positive scale factor $k \neq 1$.
1. A line through O maps onto itself.
2. A line not through O maps to a parallel line.
3. Every segment keeps its original length.
4. Every angle keeps its original measure.

Answer and reasoning

1 T; 2 T; 3 F; 4 T. Distances scale by k, while angles are preserved. Through-center lines are invariant; other lines have distinct parallel images.

Identify the center and scale factor first. Compare image length to original length. Apply the same factor to corresponding distances from the center; angle measures stay the same. Verify the result with a second corresponding length.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 16 - same standard.

Strategy: Label your diagram with the information you are given.

Describe polygon symmetry

Standard: G.CO.A.3 | DOK 1 | Big Ideas / NGL 2025: 4.2–4.3

Question

How many lines of reflection symmetry does a regular hexagon have? Select one answer.

A. 2
B. 3
C. 6
D. 12

Answer and reasoning

C. A regular hexagon has 6 lines of reflection symmetry.

Use the definition, symmetry, correspondence or rigid-motion rule named in the question. A rigid motion preserves lengths and angles. For a sequence, apply each operation in the stated order. Check each selected statement against the given figure or rule.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 21 - same standard.

Strategy: Check whether your answer needs units or square/cubic units.

Teacher key | Student practice page 32

Find a ladder angle

Standard: G.SRT.C.8 | DOK 2 | Big Ideas / NGL 2025: 9.1; 9.4–9.6

Question

A 13-foot ladder rests against a vertical wall on level ground. Its base is 5 feet from the wall. Enter the angle the ladder makes with the ground, to the nearest degree.

Answer and reasoning

67°, from arccos(5/13).

The given 5 and 13 form adjacent/hypotenuse, so cos θ = 5/13. Use inverse cosine in degree mode: θ ≈ 67.38°. Round to 67°. Do not take cos(5/13); the unknown is the angle.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 7 - same standard.

Motivation: A corrected mistake is evidence of learning.

Teacher key | Student practice page 33

Compare motion order

Standard: G.CO.A.5 | DOK 2 | Big Ideas / NGL 2025: 4.1–4.3

Question

Start with P(1,2). Sequence A reflects across the y-axis, then translates 3 units right. Sequence B translates 3 units right, then reflects across the y-axis. Enter the final point for each sequence.

Answer and reasoning

A: (2,2); B: (−4,2).

Sequence A: (1,2) → (−1,2) → (2,2). Sequence B: (1,2) → (4,2) → (−4,2). The final points differ, showing that reversing the order can change a composition.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 14 - related skill; standard differs.

Strategy: State the theorem or relationship that supports your reasoning.

Teacher key | Student practice page 34

Relate central and inscribed angles

Standard: G.C.A.2 | DOK 1 | Big Ideas / NGL 2025: 10.2; 10.4

Question

An inscribed angle intercepts an arc of 104°. What is the inscribed angle’s measure?

Answer and reasoning

52°, half the intercepted arc measure.

Identify the circle relationship before substituting: an inscribed angle is half its intercepted arc; a radius meets its tangent at 90°; an arc length is the stated fraction of the circumference. Check the units and distinguish arc measure from arc length.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 26 - related skill; standard differs.

Strategy: Keep exact values until a question asks you to round.

Teacher key | Student practice page 35

Complete a parallel construction

Standard: G.CO.D.12 | DOK 2 | Big Ideas / NGL 2025: 3.2; 1.5

Question

A transversal meets line ℓ and passes through P, a point off ℓ. To construct a line through P parallel to ℓ by copying an angle, which angle relationship should the construction create? Select one answer.

A. Congruent corresponding angles
B. Complementary corresponding angles
C. Congruent same-side interior angles in every case
D. A right angle with the transversal in every case

Answer and reasoning

A. Congruent corresponding angles guarantee parallel lines.

Name the construction goal and identify what each compass arc preserves. Explain why the selected step produces the required equal distances or angles. A drawing that only looks correct is not enough; use the construction relationships to justify it.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 10 - related skill; standard differs.

Strategy: Use a sketch to make a geometric relationship visible.

Teacher key | Student practice page 36

Recall a complementary ratio

Standard: G.SRT.C.7 | DOK 1 | Big Ideas / NGL 2025: 9.5

Question

For an acute angle θ, cos θ = 0.7. Enter sin(90° − θ).

Answer and reasoning

0.7, because sine of the complement equals cosine of the angle.

Identify corresponding vertices and sides before calculating. For similarity, justify the relationship using AA, SAS or SSS as appropriate. For a right triangle, label opposite, adjacent and hypotenuse relative to the stated angle, then choose the matching ratio. Check the result using that same correspondence.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 7 - related skill; standard differs.

Motivation: Focus on the next useful step, even when a problem feels difficult.

Teacher key | Student practice page 37

Compare possible triangles

Standard: G.SRT.B.5 | DOK 3 | Big Ideas / NGL 2025: 8.1–8.3

Question

A triangular design has sides 4, 6, and 8. Select ALL conclusions justified when it is enlarged to a similar design whose shortest side is 10.

A. The longest side is 20.
B. The perimeter is 45.
C. The two designs are congruent.
D. The new area is 6.25 times the original area.
E. The new area is 2.5 times the original area.

Answer and reasoning

A, B and D. Scale factor = 10/4 = 2.5. Sides become 10, 15, 20; perimeter 45; area scales by $2.5^2 = 6.25$. Congruence does not follow.

k = 10/4 = 2.5. Multiply each side by k: 4k=10, 6k=15, 8k=20. Add for perimeter: 10+15+20=45. Area changes by $k^2=6.25$. Similarity preserves angles, but $k \neq 1$ means these triangles are not congruent.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 12 - same standard.

Strategy: Check that your answer satisfies every condition in the question.

Teacher key | Student practice page 38

Critique similarity claims

Standard: G.SRT.A.2 | DOK 3 | Big Ideas / NGL 2025: 4.5–4.6; 8.1

Question

A student says that doubling two side lengths guarantees similar triangles. Select ALL statements that correctly evaluate this claim.

A. Two proportional sides alone always establish similarity.
B. The included angle must also match to use SAS similarity.
C. Similar triangles must have the same area.
D. Equal corresponding angles in two triangles establish similarity.

Answer and reasoning

B and D. Two side ratios alone are insufficient. Adding equal included angles gives SAS similarity; three equal angles give AA similarity. A is the original invalid claim; C confuses similarity with congruence.

Identify corresponding vertices and sides before calculating. For similarity, justify the relationship using AA, SAS or SSS as appropriate. For a right triangle, label opposite, adjacent and hypotenuse relative to the stated angle, then choose the matching ratio. Check the result using that same correspondence.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 16 - related skill; standard differs.

Strategy: Estimate first so you can judge whether your result is reasonable.

Teacher key | Student practice page 39

Use a tangent-radius relationship

Standard: G.C.A.2 | DOK 1 | Big Ideas / NGL 2025: 10.1

Question

PT is tangent to a circle at T, and O is the center. What is the measure of ∠OTP? Select one answer.

A. 0°
B. 45°
C. 90°
D. 180°

Answer and reasoning

C. A radius is perpendicular to a tangent at the point of tangency.

Identify the circle relationship before substituting: an inscribed angle is half its intercepted arc; a radius meets its tangent at 90°; an arc length is the stated fraction of the circumference. Check the units and distinguish arc measure from arc length.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 26 - related skill; standard differs.

Motivation: Confidence grows through practice, feedback, and another try.

Teacher key | Student practice page 40

Connect similarity and tangent

Standard: G.SRT.C.6 | DOK 2 | Big Ideas / NGL 2025: 9.3–9.4

Question

Two right triangles share an acute angle θ. Their opposite/adjacent leg pairs are (6, 8) and (9, 12). Explain why tan θ is the same in both triangles. A third similar triangle has adjacent leg 20. Find its opposite leg.

Answer and reasoning

AA gives similarity, so corresponding side ratios are equal: 6/8 = 9/12 = 3/4. The third opposite leg is 20(3/4) = 15.

Each triangle has a right angle and the same acute angle, so they are AA similar. Their opposite/adjacent ratios agree: 6/8=9/12=3/4. For the third triangle x/20=3/4, giving 4x=60 and x=15. Similarity explains why the tangent ratio depends on the angle, not triangle size.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 7 - related skill; standard differs.

Strategy: Compare your final answer with what the question actually asks.

Teacher key | Student practice page 41

Recall an inscribed-hexagon construction

Standard: G.CO.D.13 | DOK 1 | Big Ideas / NGL 2025: 10.4; construction task

Question

A regular hexagon is inscribed in a circle. When using a compass to step off its six vertices, what compass width should be used? Select one answer.

A. Half the radius
B. The radius
C. The diameter
D. Twice the diameter

Answer and reasoning

B. A regular inscribed hexagon’s side length equals the circle’s radius.

Name the construction goal and identify what each compass arc preserves. Explain why the selected step produces the required equal distances or angles. A drawing that only looks correct is not enough; use the construction relationships to justify it.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 10 - same standard.

Strategy: Read the whole question before choosing a method.

Teacher key | Student practice page 42

Recall a dilation property

Standard: G.SRT.A.1 | DOK 1 | Big Ideas / NGL 2025: 4.5

Question

A dilation has scale factor 2 and center O. A line does not pass through O. Its image is which of the following? Select one answer.

A. A perpendicular line
B. A parallel line
C. A circle
D. The point O

Answer and reasoning

B. A line not through the center maps to a parallel line.

Identify the center and scale factor first. Compare image length to original length. Apply the same factor to corresponding distances from the center; angle measures stay the same. Verify the result with a second corresponding length.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 16 - same standard.

Strategy: Label your diagram with the information you are given.

Teacher key | Student practice page 43

Find arc length

Standard: G.C.B.5 | DOK 1 | Big Ideas / NGL 2025: 11.1

Question

A circle has radius 9 cm. Find the exact length of an arc with central angle 80°. Use $s = (\theta/360°)\cdot 2\pi r$.

Answer and reasoning

$s = (80/360)\cdot 2\pi\cdot 9 = 4\pi$ cm.

The arc is 80/360 = 2/9 of the full circle. Circumference = $2\pi(9)=18\pi$ cm. Arc length = $(2/9)(18\pi)=4\pi$ cm. Keep the linear unit cm; sector area would use square units.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 26 - same standard.

Strategy: Check whether your answer needs units or square/cubic units.

Investigate trigonometric measurement

Standard: G.SRT.C.8 | DOK 4 | Big Ideas / NGL 2025: 9.4–9.6

Question

Classroom extension - DOK 4: Estimate the height of a real building or tree over multiple sessions. Record measured distances, instrument height and angles from at least two locations. Build and solve a trigonometric model for each location. Compare estimates with a second method or reference value, examine sensitivity to measurement error, and revise and retest your procedure. Submit a scaled diagram, data, calculations, error analysis and a supported final estimate.

Answer and reasoning

Responses vary. A valid model can use $h = d \tan \theta +$ instrument height. Require two viewpoints, a second method/reference, correct units and calculations, sensitivity/error analysis, a retested revision and evidence-based estimate. The task is a classroom extension, not an operational item format.

Suggested classroom rubric (8 points):
- Model and justification (0-2): correct similarity or trigonometric relationships, with clear assumptions.
- Evidence and calculations (0-2): required measurements, correct calculations, units and comparisons.
- Evaluation and revision (0-2): analyze error or limitations, revise the method/design and retest.
- Conclusion and communication (0-2): a clear claim supported by the recorded results.

Award 2 for complete and accurate evidence, 1 for partial evidence, and 0 for missing or incorrect evidence in each category. A one-session calculation alone does not complete the investigation.

Alignment reference: Classroom extension; not a released-item format.

Motivation: A corrected mistake is evidence of learning.

Teacher key | Student practice page 45

Identify a tangent ratio

Standard: G.SRT.C.6 | DOK 1 | Big Ideas / NGL 2025: 9.4

Question

In a right triangle, the leg opposite acute angle θ is 9 and the adjacent leg is 12. Select tan θ.

A. 4/3
B. 3/4
C. 3/5
D. 4/5

Answer and reasoning

B. opposite/adjacent = 9/12 = 3/4.

Identify corresponding vertices and sides before calculating. For similarity, justify the relationship using AA, SAS or SSS as appropriate. For a right triangle, label opposite, adjacent and hypotenuse relative to the stated angle, then choose the matching ratio. Check the result using that same correspondence.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 7 - related skill; standard differs.

Strategy: State the theorem or relationship that supports your reasoning.

Teacher key | Student practice page 46

Use proportional side lengths

Standard: G.SRT.B.5 | DOK 1 | Big Ideas / NGL 2025: 8.1; 8.4

Question

Two similar triangles have corresponding side lengths 6 and 15. A second side of the smaller triangle is 8. Enter the matching larger side length.

Answer and reasoning

20. Use scale factor 15/6 = 2.5.

Match smaller to larger: 6 → 15 gives k=15/6=2.5. Apply the same multiplier to 8: 8(2.5)=20. Check 6/15=8/20.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 12 - same standard.

Strategy: Keep exact values until a question asks you to round.

Teacher key | Student practice page 47

Calculate a scale factor

Standard: G.SRT.A.1 | DOK 1 | Big Ideas / NGL 2025: 4.5

Question

A dilation maps a segment of length 8 to a segment of length 20. Enter the positive scale factor.

Answer and reasoning

2.5, from image length/original length = 20/8.

Identify the center and scale factor first. Compare image length to original length. Apply the same factor to corresponding distances from the center; angle measures stay the same. Verify the result with a second corresponding length.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 16 - same standard.

Strategy: Use a sketch to make a geometric relationship visible.

Teacher key | Student practice page 48

Find a missing dimension

Standard: G.GMD.A.3 | DOK 1 | Big Ideas / NGL 2025: 12.4

Question

A cone has volume 150π cm³ and radius 5 cm. Use V = (1/3)πr²h to find its height. Select one answer.

A. 6 cm
B. 18 cm
C. 30 cm
D. 45 cm

Answer and reasoning

B. 150π = (25π/3)h gives h = 18 cm.

Substitute r=5: 150π=(1/3)π(25)h. Divide by π, then multiply by 3: 450=25h. Divide by 25: h=18 cm. Check (1/3)π(25)(18)=150π cm³.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 2 - related skill; standard differs.

Motivation: Focus on the next useful step, even when a problem feels difficult.

Teacher key | Student practice page 49

Use an indirect-measurement model

Standard: G.SRT.B.5 | DOK 2 | Big Ideas / NGL 2025: 8.2; 8.4

Question

A student uses a mirror on level ground to view the top of a pole. The student’s eye height is 1.6 m. The horizontal distances from the mirror to the student and to the pole are 2 m and 11 m. The viewing triangles are similar. Enter the pole’s height in meters.

Answer and reasoning

8.8. h/11 = 1.6/2, so h = 8.8 m.

Use corresponding height/distance ratios: h/11=1.6/2. Multiply by 11: h=11(0.8)=8.8 m. The mirror setup requires equal viewing angles and vertical objects on level ground to justify AA similarity.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 12 - same standard.

Strategy: Check that your answer satisfies every condition in the question.

Design and test an accessible ramp

Standard: G.SRT.C.8 | DOK 4 | Big Ideas / NGL 2025: 9.4–9.6

Question

Classroom extension - DOK 4: Investigate a ramp design for a teacher-approved site. Gather the rise, available ground distance and a supplied maximum angle or slope constraint. Propose three feasible or infeasible plans and justify their classification with right-triangle calculations. Build scale models, obtain feedback on practicality, and revise one plan. Present measurements, constraints, trigonometric calculations, tested models and a supported recommendation. Do not treat the classroom constraint as a legal accessibility standard.

Answer and reasoning

Responses vary. Require recorded rise/run constraints, three correctly analyzed plans, right-triangle/trigonometric calculations, scale models and feedback, revision, and a justified final plan. This models design reasoning and is not a released-test response format.

Suggested classroom rubric (8 points):
• Model and justification (0-2): correct similarity or trigonometric relationships, with clear assumptions.
• Evidence and calculations (0-2): required measurements, correct calculations, units and comparisons.
• Evaluation and revision (0-2): analyze error or limitations, revise the method/design and retest.
• Conclusion and communication (0-2): a clear claim supported by the recorded results.
Award 2 for complete and accurate evidence, 1 for partial evidence, and 0 for missing or incorrect evidence in each category. A one-session calculation alone does not complete the investigation.

Alignment reference: Classroom extension; not a released-item format.

Strategy: Estimate first so you can judge whether your result is reasonable.

Teacher key | Student practice page 51

Identify a cosine ratio

Standard: G.SRT.C.6 | DOK 1 | Big Ideas / NGL 2025: 9.5

Question

In a right triangle, the leg adjacent to angle θ is 12 and the hypotenuse is 13. Select cos θ.

A. 5/13
B. 12/13
C. 12/5
D. 13/12

Answer and reasoning

B. adjacent/hypotenuse = 12/13.

Identify corresponding vertices and sides before calculating. For similarity, justify the relationship using AA, SAS or SSS as appropriate. For a right triangle, label opposite, adjacent and hypotenuse relative to the stated angle, then choose the matching ratio. Check the result using that same correspondence.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 7 - related skill; standard differs.

Motivation: Confidence grows through practice, feedback, and another try.

Teacher key | Student practice page 52

Use coordinates to find area

Standard: G.GPE.B.7 | DOK 1 | Big Ideas / NGL 2025: 1.3–1.4

Question

Rectangle ABCD has vertices A(−2, 1), B(4, 1), C(4, 5), D(−2, 5). Find its area.

Answer and reasoning

Width = 6 and height = 4, so area = 24 square units.

Horizontal length = 4−(−2)=6. Vertical length = 5−1=4. Area = 6 × 4=24 square units. Count coordinate differences, not the coordinates themselves.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 19 - same standard.

Strategy: Compare your final answer with what the question actually asks.

Teacher key | Student practice page 53

Use similar right triangles

Standard: G.SRT.C.6 | DOK 1 | Big Ideas / NGL 2025: 9.3–9.5

Question

A right triangle has opposite leg 3 and hypotenuse 5 for an acute angle θ. A similar right triangle has hypotenuse 20. Enter its opposite leg.

Answer and reasoning

12. The scale factor is 20/5 = 4.

The common angle and right angles give AA similarity. The larger hypotenuse is 20/5=4 times the smaller. The matching opposite leg is 3 × 4=12; check 12/20=3/5.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 7 - related skill; standard differs.

Strategy: Read the whole question before choosing a method.

Teacher key | Student practice page 54

Identify a practical model

Standard: G.MG.A.1 | DOK 1 | Big Ideas / NGL 2025: 12.6

Question

A grain silo has a cylindrical body topped by a cone. Which geometric model represents the silo? Select one answer.

A. A cylinder only
B. A cylinder and a cone
C. A sphere and a cone
D. A rectangular prism

Answer and reasoning

B. Combine the cylinder and cone.

Identify the requested quantity and choose the matching geometric formula or model. Substitute the given dimensions, show intermediate calculations, and check units. Distinguish linear measures, area, volume and density.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 2 - same standard.

Strategy: Label your diagram with the information you are given.

Teacher key | Student practice page 55

Recognize complementary functions

Standard: G.SRT.C.7 | DOK 1 | Big Ideas / NGL 2025: 9.5

Question

Which expression equals sin 35°? Select one answer.

A. cos 35°
B. sin 55°
C. cos 55°
D. tan 55°

Answer and reasoning

C. sin 35° = cos 55°.

Identify corresponding vertices and sides before calculating. For similarity, justify the relationship using AA, SAS or SSS as appropriate. For a right triangle, label opposite, adjacent and hypotenuse relative to the stated angle, then choose the matching ratio. Check the result using that same correspondence.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 7 - related skill; standard differs.

Strategy: Check whether your answer needs units or square/cubic units.

Teacher key | Student practice page 56

Compare scale factors

Standard: G.SRT.A.1 | DOK 2 | Big Ideas / NGL 2025: 4.5

Question

A dilation with positive scale factor maps AB = 6 to A′B′ = 15 and BC = 8 to B′C′ = x. Enter the scale factor k and the value of x.

Answer and reasoning

k = 2.5 and x = 20. Corresponding segment lengths share the same scale factor.

Use image/original: k=15/6=2.5. Then x=8k=20. Verify 15/6=20/8. Do not reverse only one of the ratios.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 16 - same standard.

Motivation: A corrected mistake is evidence of learning.

Teacher key | Student practice page 57

Combine volume and density

Standard: G.MG.A.2 | DOK 1 | Big Ideas / NGL 2025: 12.6

Question

A solid has volume 20 cm^3 and density 7.8 g/cm^3. Find its mass using mass = density × volume.

Answer and reasoning

Mass = 7.8 × 20 = 156 g.

Use mass = density × volume: $(7.8\ g/cm^3)(20\ cm^3)=156$ g. The cubic-centimeter units cancel. This is mass, not volume.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 8 - same standard.

Strategy: State the theorem or relationship that supports your reasoning.

Teacher key | Student practice page 58

Investigate a scaled prototype

Standard: G.SRT.B.5 | DOK 4 | Big Ideas / NGL 2025: 8.1; 8.4

Question

Classroom extension - DOK 4: Design a scale model of a real triangular structure. Obtain measurements, choose and justify a scale, and build two prototypes using different scales or materials. Predict dimensions from similarity, test actual dimensions and angle agreement, and examine construction errors. Revise one prototype and retest it. Submit data, proportional calculations, a similarity justification, prototype images and an evidence-based explanation of the revision.

Answer and reasoning

Responses vary. Require real/reference dimensions, justified scales, two prototypes, correct corresponding-length calculations, angle/similarity checks, actual test results, error analysis and a revised/retested model. This is an extended-learning task, not a released NJGPA-A item.

Suggested classroom rubric (8 points):
• Model and justification (0-2): correct similarity or trigonometric relationships, with clear assumptions.
• Evidence and calculations (0-2): required measurements, correct calculations, units and comparisons.
• Evaluation and revision (0-2): analyze error or limitations, revise the method/design and retest.
• Conclusion and communication (0-2): a clear claim supported by the recorded results.
Award 2 for complete and accurate evidence, 1 for partial evidence, and 0 for missing or incorrect evidence in each category. A one-session calculation alone does not complete the investigation.

Alignment reference: Classroom extension; not a released-item format.

Strategy: Keep exact values until a question asks you to round.

Teacher key | Student practice page 59

Complete an area argument

Standard: G.GMD.A.1 | DOK 3 | Big Ideas / NGL 2025: 11.2

Question

Many narrow equal sectors of a circle of radius r are rearranged alternately into a shape approaching a rectangle. Select the row that correctly gives the limiting base, height, and area.

A. Base $2\pi r$; height r; area $2\pi r^2$

B. Base πr; height 2r; area $2\pi r^2$

C. Base πr; height r; area πr^2

D. Base r; height r; area r^2

Answer and reasoning

C. The base approaches half the circumference, πr, and height approaches r.

Identify the requested quantity and choose the matching geometric formula or model. Substitute the given dimensions, show intermediate calculations, and check units. Distinguish linear measures, area, volume and density.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 5 - same standard.

Strategy: Use a sketch to make a geometric relationship visible.

Teacher key | Student practice page 60

Calculate cylinder volume

Standard: G.GMD.A.3 | DOK 1 | Big Ideas / NGL 2025: 12.2; 12.4–12.5

Question

A cylinder has radius 3 cm and height 8 cm. Find its exact volume using $V = \pi r^2 h$.

Answer and reasoning

$V = \pi \cdot 3^2 \cdot 8 = 72\pi$ cm³.

Use $V=\pi r^2 h$ with $r=3$ and $h=8$: $V=\pi(3^2)(8)=\pi(9)(8)=72\pi$ cm³. The radius is squared before multiplying by height. A decimal approximation is acceptable only if the response instructions request or allow it.

Feedback prompt

Which given fact or relationship supports your answer? Show how your result satisfies the original question. For a select-all item, verify each option independently.

Alignment reference: Official online practice item 2 - related skill; standard differs.

Motivation: Focus on the next useful step, even when a problem feels difficult.

Sources and alignment notes

2023 NJSLS Mathematics: Geometry

Open official NJDOE / assessment resource

NJSLA-A Geometry reporting categories

Open official NJDOE / assessment resource

NJGPA-A Mathematics Blueprint

Open official NJDOE / assessment resource

Official online practice answer/alignment key

Open official NJDOE / assessment resource

Online and paper practice item numbering may differ. The references in this key use the ONLINE answer-key sequence. These are original practice questions, not reproduced released items. DOK labels and the extended-task rubric are classroom planning tools. Source review: October 28, 2026.

Strategy: Check that your answer satisfies every condition in the question.