

Angle Art Studio

Teacher Guide & Answer Keys

Grade 4 · All levels

Overview

Students create geometric artwork. They draw points, lines, rays and angles, measure and sketch angles with a protractor, add angle measures to find unknown angles, classify shapes by their sides and angles, and add lines of symmetry.

Time: 3 class periods · **Product:** Geometric Art Piece · **Standards:** 4.G.A.1, 4.G.A.2, 4.G.A.3, 4.MD.C.5, 4.MD.C.6, 4.MD.C.7

Suggested pacing

- Day 1: Introduce the challenge, read the scenario together, and work Parts 1–2 in pairs.
- Day 2: Finish the remaining parts and create the final product.
- Day 3: Share products in a gallery walk and reflect.

Levels

- **Remedial:** smaller numbers, fewer steps, more structure.
- **Standard:** grade-level numbers and the full set of tasks.
- **Advanced:** harder numbers, extra reasoning and multi-step questions.

All three levels practice the same learning goals, so the class can share and compare work.

Rubric

Category	4 Excellent	3 Good	2 Developing	1 Beginning
Math accuracy	All answers correct	Most answers correct	Some answers correct	Few answers correct
Shows work	Clear work for every step	Work for most steps	Some work shown	Little work shown
Explains thinking	Clear, complete explanations	Mostly clear explanations	Some explanation	Little explanation
Final product	Complete, neat and creative	Complete and neat	Partly complete	Not complete



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Answer key · Remedial KEY

Part 1: Lines in Your Art

1. Draw and label: a point, a line, a line segment and a ray.

Check: a line has two arrows, a segment has two endpoints, a ray has one endpoint and one arrow.

2. Draw a pair of parallel lines and a pair of perpendicular lines. How are they different?

Parallel lines never meet and stay the same distance apart. Perpendicular lines meet to form right angles.

Part 2: Measure and Classify Angles

3. Classify the 40° angle.

acute

4. Classify the 90° angle.

right

5. Classify the 120° angle.

obtuse

6. A dial turns $\frac{1}{4}$ of a full circle. How many degrees is that?

$\frac{1}{4}$ of 360° = 90°

Part 3: Angles That Add

7. What is the measure of the other angle? Write an equation.

30 + x = 90, so x = 60°

8. 2 angles share a vertex and do not overlap. They measure 50°, 70°. What is the measure of the whole angle?

50 + 70 = 120°

9. Is the whole angle acute, right, obtuse or straight?

obtuse

Part 4: Shapes and Symmetry

10. How many lines of symmetry does a square have?

4

11. How many lines of symmetry does a rectangle (not a square) have?

2

12. How many lines of symmetry does a equilateral triangle have?

3

13. How many lines of symmetry does a right triangle with sides of different lengths have?

0

14. Sort your shapes: which have at least one pair of parallel sides?

The square and the rectangle.

15. Finish your art piece. Label 3 angles with their measures.

Check the labeled measures with a protractor (within about 2°).

Extension

Examples: an isosceles triangle, a kite, the letter A.



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Answer key · Standard KEY

Part 1: Lines in Your Art

1. Draw and label: a point, a line, a line segment and a ray.

Check: a line has two arrows, a segment has two endpoints, a ray has one endpoint and one arrow.

2. Draw a pair of parallel lines and a pair of perpendicular lines. How are they different?

Parallel lines never meet and stay the same distance apart. Perpendicular lines meet to form right angles.

Part 2: Measure and Classify Angles

3. Classify the 35° angle.

acute

4. Classify the 90° angle.

right

5. Classify the 145° angle.

obtuse

6. A dial turns $\frac{1}{6}$ of a full circle. How many degrees is that?

$\frac{1}{6}$ of 360° = 60°

Part 3: Angles That Add

7. What is the measure of the other angle? Write an equation.

55 + x = 90, so x = 35°

8. 3 angles share a vertex and do not overlap. They measure 45°, 60°, 35°. What is the measure of the whole angle?

45 + 60 + 35 = 140°

9. Is the whole angle acute, right, obtuse or straight?

obtuse

Part 4: Shapes and Symmetry

10. How many lines of symmetry does a square have?

4

11. How many lines of symmetry does a rectangle (not a square) have?

2

12. How many lines of symmetry does a equilateral triangle have?

3

13. How many lines of symmetry does a right triangle with sides of different lengths have?

0

14. Sort your shapes: which have at least one pair of parallel sides?

The square and the rectangle.

15. Finish your art piece. Label 3 angles with their measures.

Check the labeled measures with a protractor (within about 2°).

Extension

30°. The clock face has 12 equal parts, and 360° ÷ 12 = 30°.



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Answer key · Advanced KEY

Part 1: Lines in Your Art

1. Draw and label: a point, a line, a line segment and a ray.

Check: a line has two arrows, a segment has two endpoints, a ray has one endpoint and one arrow.

2. Draw a pair of parallel lines and a pair of perpendicular lines. How are they different?

Parallel lines never meet and stay the same distance apart. Perpendicular lines meet to form right angles.

Part 2: Measure and Classify Angles

3. Classify the 35° angle.

acute

4. Classify the 90° angle.

right

5. Classify the 145° angle.

obtuse

6. Classify the 180° angle.

straight

7. A dial turns $\frac{5}{12}$ of a full circle. How many degrees is that?

$\frac{5}{12}$ of 360° = 150°

Part 3: Angles That Add

8. What is the measure of the other angle? Write an equation.

65 + x = 180, so x = 115°

9. 3 angles share a vertex and do not overlap. They measure 38°, 67°, 49°. What is the measure of the whole angle?

38 + 67 + 49 = 154°

10. Is the whole angle acute, right, obtuse or straight?

obtuse

Part 4: Shapes and Symmetry

11. How many lines of symmetry does a square have?

4

12. How many lines of symmetry does a rectangle (not a square) have?

2

13. How many lines of symmetry does a equilateral triangle have?

3

14. How many lines of symmetry does a right triangle with sides of different lengths have?

0

15. Sort your shapes: which have at least one pair of parallel sides?

The square and the rectangle.

16. Finish your art piece. Label 3 angles with their measures.

Check the labeled measures with a protractor (within about 2°).

Extension

360 − (85 + 110 + 95) = 70°. It is acute.



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Worked teacher example (Standard, Part 1)

Draw and label: a point, a line, a line segment and a ray.

Check: a line has two arrows, a segment has two endpoints, a ray has one endpoint and one arrow.

Draw a pair of parallel lines and a pair of perpendicular lines. How are they different?

Parallel lines never meet and stay the same distance apart. Perpendicular lines meet to form right angles.

Model the first part aloud: read the situation, name the operation, estimate, solve, and check. Then let partners try Part 2.

Look for

- Students use correct notation and units in every answer.
- Students explain why an answer is reasonable (estimates, benchmarks, pictures).
- Final products show the math clearly, not just the answers.