Naming Angles in Geometry

Geometry Worksheet · Grade 6–8

Name: _____ Date: _____

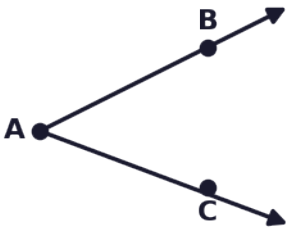
Learning Objectives

- Identify the parts of an angle: sides (rays) and vertex
- Name an angle using a vertex letter, a number, or three-point notation with the vertex in the middle
- Distinguish between the interior and exterior of an angle

Problems

1. Look at the angle shown. Label the two parts of an angle: what do we call the two rays that form the angle, and what do we call the common endpoint where they meet?

Angle with Vertex A



2. Using the figure, name the angle using only the vertex letter.

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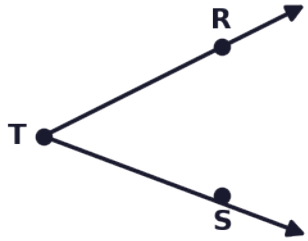
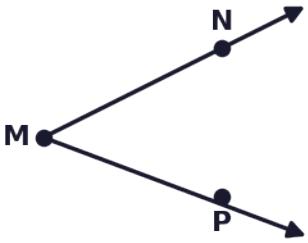


3. Name the angle shown using three letters (three-point notation). Write both possible three-letter names.



4. Point D is in the interior of the angle shown. Point E is in the exterior. Which point is between the two sides of the angle, and which is outside?

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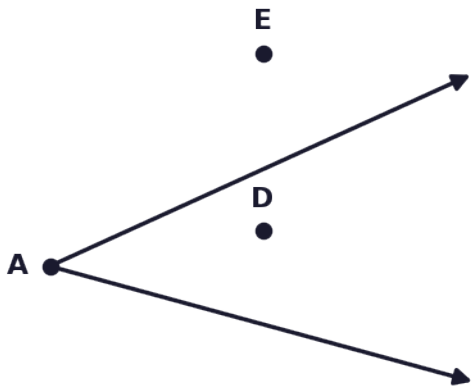
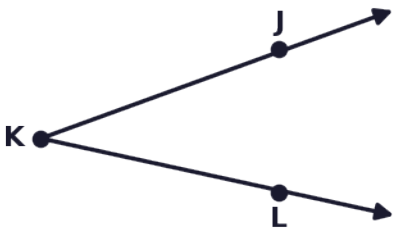


5. An angle is labeled with the number 3 in the opening between its two sides. The vertex is point K. Write three different correct names for this angle.



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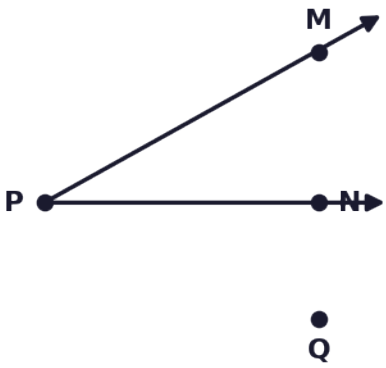
6. Look at the diagram with multiple angles sharing vertex P. Angles 1 and 2 are formed. Name angle 1 and angle 2 each using three-letter notation.



7. A student writes Angle ABC to name an angle with vertex at B. Another student writes Angle CBA for the same angle. Are both names correct? Explain why or why not.

8. A student writes Angle ABD to name the angle with vertex at D, using points A, B, and D. Explain the error and write the correct name.

9. Using the figure, list ALL possible names for the angle formed at vertex W. Points X and Y lie on the two rays from W.

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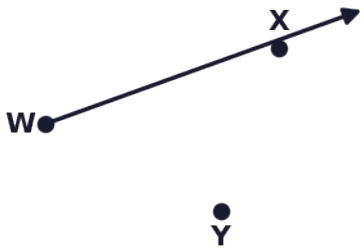

10. In the figure, four rays all start from point O, creating angles 1, 2, and 3. The four rays pass through points A, B, C, and D respectively. Name each of the three angles using three-letter notation, then write one additional name for the entire angle from ray OA to ray OD.

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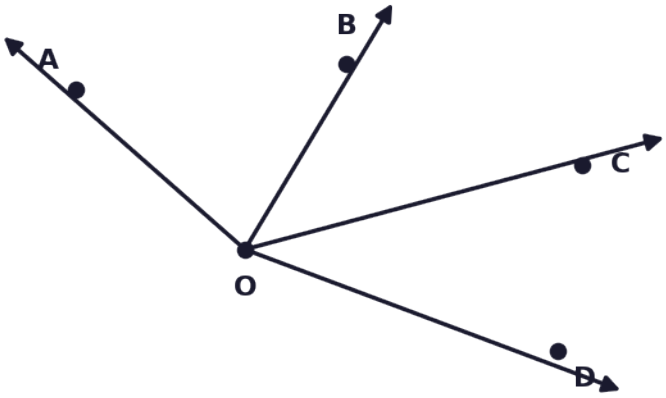

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Naming Angles in Geometry — Answer Key

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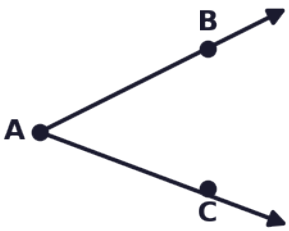
Answer Key

1. Answer: The two rays are called the sides of the angle; the common endpoint A is called the vertex.

Angle with Vertex A



- An angle is formed by two rays that share a common endpoint.
- The two rays are the sides of the angle.
- The shared endpoint is called the vertex — here it is point A.

2. Answer: Angle T

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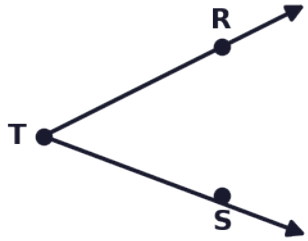
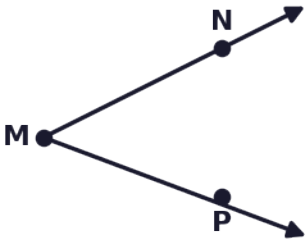


- When naming an angle by its vertex alone, use the letter at the common endpoint.
- The vertex here is point T.
- Therefore the angle is named Angle T.

3. Answer: Angle NMP and Angle PMN



- In three-letter notation, the vertex letter must always be in the middle.
- The vertex is M; one side passes through N and the other through P.
- The two valid names are Angle NMP and Angle PMN.

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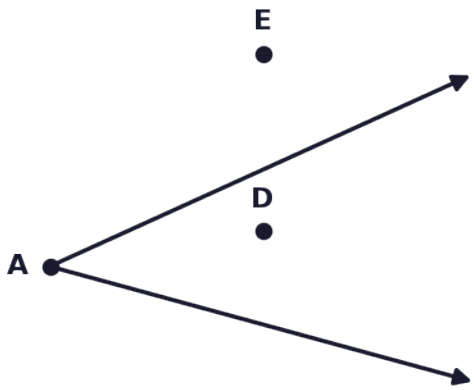
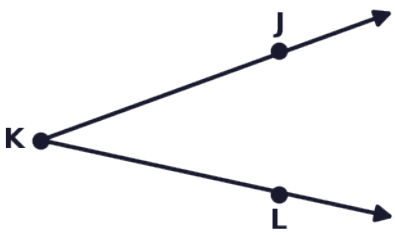
4. Answer: Point D is in the interior (between the two sides); Point E is in the exterior (outside the sides).



- The interior of an angle contains all points between the two rays.
- Point D lies in the region between the two rays — it is in the interior.
- Point E lies outside the two rays — it is in the exterior.

5. Answer: Angle 3, Angle K, Angle JKL (or Angle LKJ)



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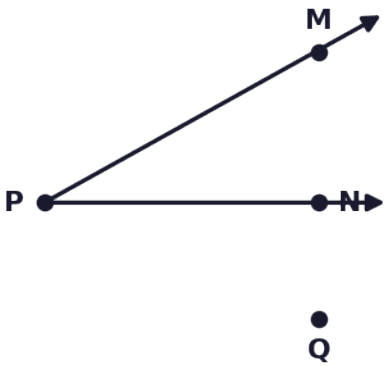
- Method 1: Use the number written inside the angle opening — Angle 3.
- Method 2: Use only the vertex letter — Angle K.
- Method 3: Use three letters with the vertex in the middle — Angle JKL or Angle LKJ.

6. Answer: Angle 1 = Angle MPN; Angle 2 = Angle NPQ



- Angle 1 is between rays PM and PN, so its three-letter name is Angle MPN.
- Angle 2 is between rays PN and PQ, so its three-letter name is Angle NPQ.
- Note: when multiple angles share the same vertex, a number or three-letter name is preferred over just the vertex letter.

7. Answer: Yes, both names are correct because the vertex B stays in the middle and only the outer letters are swapped.

- In three-letter angle notation, the vertex must always be the middle letter.
- Angle ABC has vertex B in the middle — correct.
- Angle CBA also has vertex B in the middle — also correct.
- Swapping only the two outer letters (A and C) gives an equivalent name for the same angle.

8. Answer: The error is that the vertex D is not in the middle. The correct name is Angle ADB or Angle BDA.

- In three-letter angle notation the vertex must always be the middle letter.
- If the vertex is D, then D must appear as the second letter.
- Angle ABD places B in the middle, suggesting B is the vertex — that is incorrect.
- The correct names are Angle ADB or Angle BDA.

9. Answer: Angle W, Angle XWY, Angle YWX

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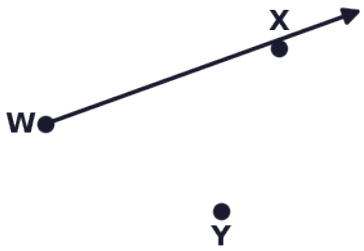

- Method 1 — vertex only: Angle W.
- Method 2 — three-letter notation with vertex W in the middle: Angle XWY.
- Method 3 — reverse the outer letters: Angle YWX.
- A number label could also be used if one were given inside the angle.

10. Answer: Angle 1 = Angle AOB; Angle 2 = Angle BOC; Angle 3 = Angle COD; Entire angle from A to D = Angle AOD (or Angle DOA).

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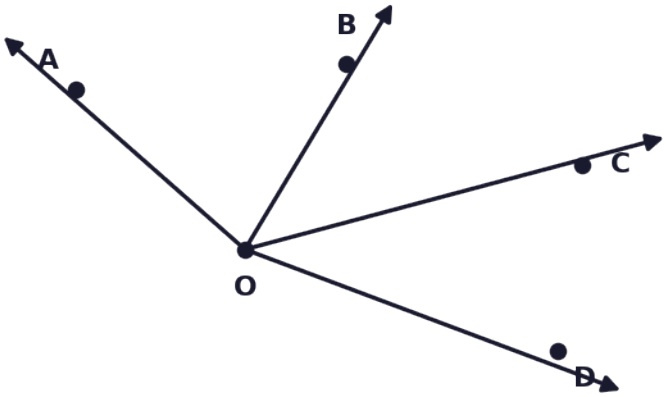

• Angle 1 is between rays OA and OB — three-letter name: Angle AOB.
• Angle 2 is between rays OB and OC — three-letter name: Angle BOC.
• Angle 3 is between rays OC and OD — three-letter name: Angle COD.
• The combined angle from ray OA to ray OD spans all three smaller angles — its name is Angle AOD (or Angle DOA), always keeping the vertex O in the middle.

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