

ANSWER MAZE



POINTS, LINES, PLANES AND DEFINITIONS

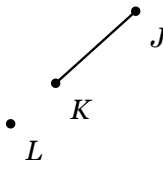
Points, Lines, Rays: the Definition or the Drawing?

One page · 10–15 minutes · nothing to prepare

FREE

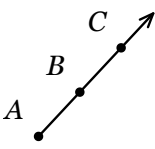
1 Is L on segment JK?
yes → go to 2
no → go to 6

Where does the ink end with a dot? Where does it end with an arrowhead?



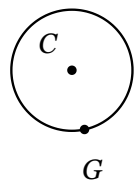
2 Which is another name for ray AB?
ray AC → go to 3
ray BA → go to 5

A ray is named from its endpoint first.



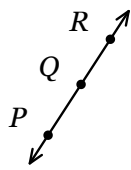
3 Is C on the circle?
no → go to 7
yes → go to 1

Which points are exactly one radius from the center?



4 Is line RQ the same line as line PQ?
no → go to 5
yes → you are out

Any two points of a line name it, in either order.



1. **Hand out page 3.** That is the whole preparation.
2. **Say this once:** *“Every box has two answers. One is what the definition says. The other is what the drawing seems to say. Take the definition.”*
3. **Start at box 6.** Six boxes and you are out. **Write every box number in the row at the foot as you go.**

Student sheet	page 3, one per student. The five objects are printed on it as pictures.
Answers	page 4.

The route is 6 → 2 → 3 → 7 → 8 → 4 → out. Boxes 1 and 5 are not on it. **They look like every other box:** a figure, a question, two answers, two box numbers and a hint. Both of their answers lead back onto the route.

The two boxes off the route catch the two mistakes of this lesson. Three boxes send a wrong answer to box 1. A student there *trusted the drawing*. They said that a point past the end of the drawn line is not on the line, that the center is on the circle, or that a crossing that looks square is perpendicular. Three boxes send a wrong answer to box 5. A student there *went by the letters, not the object*. They took ray BA to be ray AB, or they thought two names of one line were two different lines.

Every wrong answer is the one the drawing seems to give. This is on purpose. Students use a definition only when the everyday picture gives the wrong answer. If a student is stuck, ask: *“What does the arrowhead mean? Where does the ray start?”*

What the row at the foot tells you in one glance. A clean run is **six numbers**. A longer row shows where the student went wrong: the number just before 1 or 5 is the box they got wrong.



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Answer Maze

Start at box 6 · answer, then follow that box number

Name _____

Period _____

Date _____



Line

goes on forever both ways



Ray

starts at its dot, goes on one way



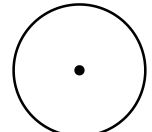
Segment

stops at both dots



Angle

two rays from one dot, and both go on



Circle

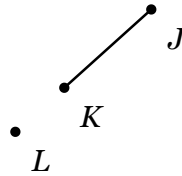
the curve only, not the center, not the inside

Is L on segment JK?

yes → go to 2

no → go to 6

Where does the ink end with a dot?
Where does it end with an arrowhead?

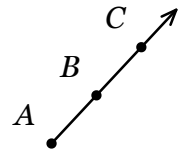


Which is another name for ray AB?

ray AC → go to 3

ray BA → go to 5

A ray is named from its endpoint first.

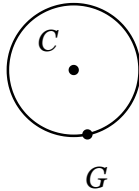


Is C on the circle?

no → go to 7

yes → go to 1

Which points are exactly one radius from the center?

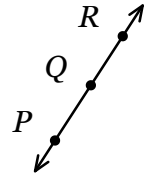


Is line RQ the same line as line PQ?

no → go to 5

yes → you are out

Any two points of a line name it, in either order.

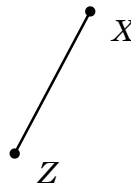


Is segment ZX the same as segment XZ?

yes → go to 3

no → go to 2

Does the order of the two letters change which points are meant?

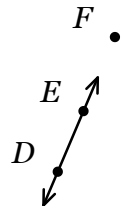


Is F on line DE?

no → go to 1

yes → go to 2

An arrowhead says the line goes on past the ink.

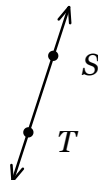


Are ray ST and ray TS the same ray?

yes → go to 5

no → go to 8

Put a finger on where each one starts, then follow it.

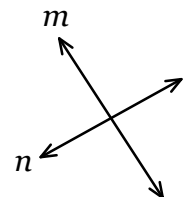


Is line m perpendicular to line n?

no way to tell → go to 4

yes → go to 1

Look for a small square at the crossing. Do not decide just by looking.



Write every box number here as you go. This helps you find your way back if you lose your place. A **clean run** is six numbers.

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Answer Maze — answers

For the teacher

The route, in order. Boxes 1 and 5 are not on it. They come last in the table. A student reaches them only by a wrong answer.

6 → 2 → 3 → 7 → 8 → 4 → out

	Box	The question	Answer	Wrong answer goes to	Right goes to
1	Box 6	Is F on line DE?	yes	no → 1 (trusted the drawing)	box 2
2	Box 2	Which is another name for ray AB?	ray AC	ray BA → 5 (mixed up the names)	box 3
3	Box 3	Is C on the circle?	no	yes → 1 (trusted the drawing)	box 7
4	Box 7	Are ray ST and ray TS the same ray?	no	yes → 5 (mixed up the names)	box 8
5	Box 8	Is line m perpendicular to line n?	no way to tell	yes → 1 (trusted the drawing)	box 4
6	Box 4	Is line RQ the same line as line PQ?	yes	no → 5 (mixed up the names)	out
	Box 1	Is L on segment JK?	no	yes → 2 (trusted the drawing)	box 6
	Box 5	Is segment ZX the same as segment XZ?	yes	no → 2 (mixed up the names)	box 3

Why each right answer is right. A line goes on past its arrowheads, so a point on it past the drawn line is on it. A circle is all the points at one distance from the center. The center is at distance zero, so it is not on the circle. A segment stops at its endpoints. A line can be named by any two of its points, in either order, and so can a segment. A ray is named from its endpoint first, so ray ST starts at S and ray TS starts at T. Two lines are perpendicular only if a square mark says so. A crossing with no mark that looks square gives *no way to tell*. Here it is drawn at 86° , and no eye can tell that from 90° .