Points, Lines, Rays, and Angles

Spot mistakes, reason, and work backward

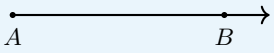
Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

A point names a location. A line extends in both directions (0 endpoints); a ray extends in one direction (1 endpoint); a segment stops at both ends (2 endpoints). Parallel lines never meet; perpendicular lines meet at $90°$. $\overrightarrow{AB}$ starts at A and passes through B.

Worked example

Identify and name this object; state its number of endpoints.



1. The filled point A is the single endpoint; the arrow shows extension past B.

2. This object has 1 endpoints, which identifies a ray.

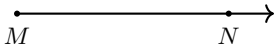
3. Name the endpoint first: $\overrightarrow{AB}$.

Answer: Ray $\overrightarrow{AB}$; 1 endpoints.

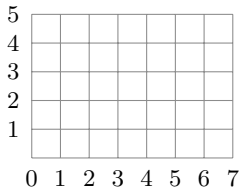
Practice Problems

Show your thinking.

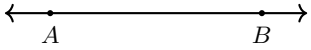
1. A student calls this a segment. Correct the object and explain its endpoint count.



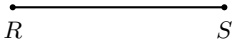
2. Draw a line through two new points P, Q on the blank grid. Show that it has no endpoints.



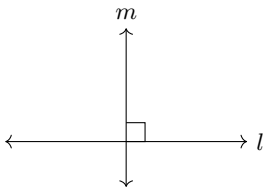
3. Can $\overrightarrow{AB}$ and $\overrightarrow{BA}$ be the same ray when $A \neq B$? Explain.



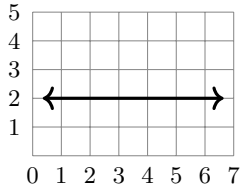
4. Give a name and the endpoint count for the straight object that stops at R and S.



5. One street runs east–west and another north–south. Use the diagram to classify their lines.



6. Add a horizontal line above the line on this grid. Explain why the pair is parallel.



Answer Key

1. Ray $\overrightarrow{MN}$; 1 endpoints.
2. A straight line through P, Q with arrows at both ends.
3. No.
4. Segment $\overline{RS}$; 2 endpoints.
5. Perpendicular lines.
6. For example, draw a line along row 4 above the given row 2.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The filled point M is the single endpoint; the arrow shows extension past N.

2. This object has 1 endpoints, which identifies a ray.

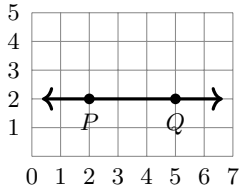
3. Name the endpoint first: $\overrightarrow{MN}$.

Problem 2

1. Choose P at column 2, row 2, and Q at column 5 on the same row.

2. Draw straight through both points and add 2 arrowheads, one at each end.

3. The arrows show continuation. Neither P nor Q is an endpoint.



Problem 3

1. $\overrightarrow{AB}$ starts at A and continues through B.

2. $\overrightarrow{BA}$ starts at B and continues through A.

3. The endpoints differ, so they are different rays even though they lie on one line.

Problem 4

1. The description stops at R and stops at S.

2. Two stopping points give 2 endpoints.

3. A two-endpoint straight object is a line segment, named $\overline{RS}$.

Problem 5

1. East–west is a horizontal direction; north–south is vertical.

2. The directions meet at $90°$.

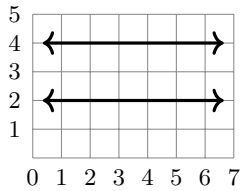
3. A right-angle intersection makes the lines perpendicular.

Problem 6

1. The given line follows row 2.

2. Draw both arrows on a line that follows row 4, two units above.

3. The separation stays constant and they never meet, so the two lines are parallel.



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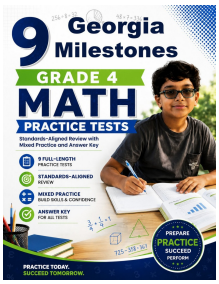

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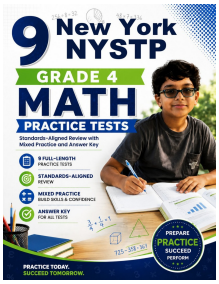

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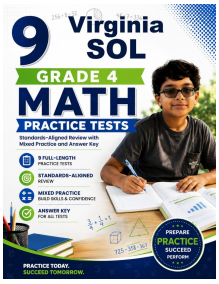

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