Points, Lines, Rays, and Angles

Apply the skill to decisions and designs

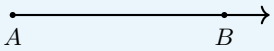
Name _____ **Date** _____ **Score** _____ / 6

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.

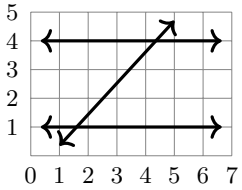
Practice Problems

Show your thinking.

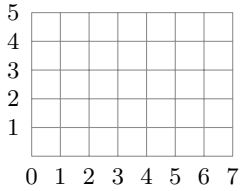
1. Towns U, S, T are in that order on one straight road. A route must start at S, pass through T, and never reach U. Choose $\overrightarrow{ST}$, $\overrightarrow{TS}$, or $\overleftrightarrow{ST}$.

2. A straight bridge starts at J and ends at K. A path starts at J, crosses the bridge and continues past K in the same direction. Which geometric object models each, and what do the objects share?

3. Two parallel streets run along grid rows. A new street crosses both at a slant. A plan says that crossing both means it is perpendicular to both. Does crossing alone prove that?

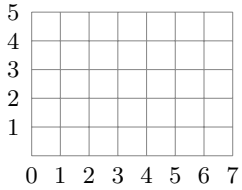


4. Draw two perpendicular segments on this grid as a cross. Mark a right angle.



5. Points A, O, B are in that order on one line. Two rays start at O, one through A and one through B. What angle do they form, and what object do they make together?

6. Design two parallel fence lines on the grid and a third line perpendicular to both. Mark the two right angles.



Answer Key

1. Only $\overrightarrow{ST}$.

2. Bridge $\overline{JK}$; path $\overrightarrow{JK}$. They share J and every point through K.

3. No. Perpendicular streets must cross at $90°$.

4. Example: a row segment and column segment that meet at column 4, row 3.

5. A straight angle, $180°$. Together the opposite rays make a line.

6. Example: horizontal lines on rows 1 and 4, crossed by a vertical line at column 4.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. $\overrightarrow{ST}$ starts at S and goes toward T, away from U.

2. $\overrightarrow{TS}$ starts at the wrong town and continues through S toward U.

3. The line has no start and extends through U too.

Problem 2

1. The bridge stops at both marked points, making a segment.

2. The path starts at J but does not stop at K, making a ray.

3. The bridge lies inside the ray. K is an endpoint only for the bridge.

Problem 3

1. The two row streets stay parallel because they keep the same direction.

2. The slanted street crosses them but does not make a square corner.

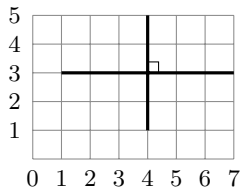
3. Two lines can intersect without being perpendicular. A right-angle mark or measurement is needed.

Problem 4

1. Draw a segment along row 3 from column 1 to 7.

2. Draw a vertical segment along column 4 from row 1 to row 5. Neither gets arrowheads.

3. Mark a square corner at the intersection to show $90°$.



Problem 5

1. Both rays share O, but they extend in opposite directions.

2. The opening between opposite directions is a straight angle of $180°$.

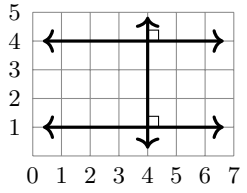
3. The rays together extend both ways without stopping, so their union is the whole line.

Problem 6

1. Use two distinct horizontal lines along rows 1 and 4. The spacing never changes.

2. Cross them with a vertical line along column 4. Use arrows at both ends of each line.

3. Mark $90°$ at each meeting point. The vertical line is perpendicular to both.



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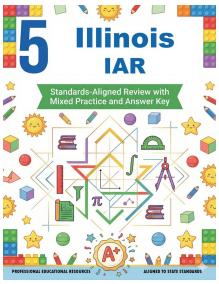

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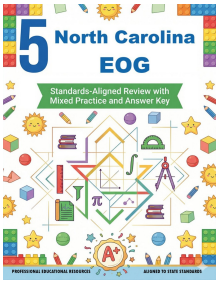

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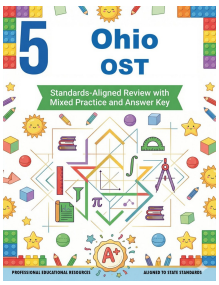

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