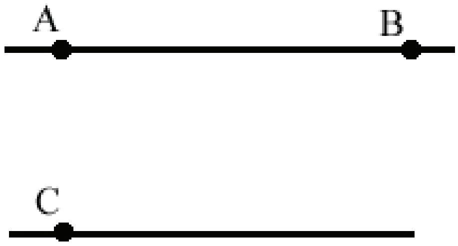
Guided Practice 5.1.1

Example 1

Refer to the figures below. Can a line segment be defined using the points *A* and *B*? Can a line segment be defined using the point *C*? Justify your response to each question.

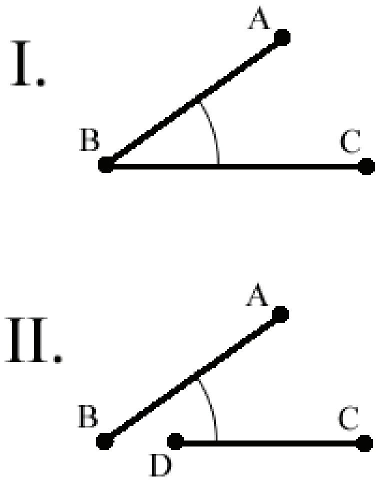


1. The points *A* and *B* can be used to define a line segment because *A* and *B* are on the same line and are unique points.

2. The point *C* cannot be used to define a line segment because there is not a second point defined on the line.

Example 2

Refer to the figures below. In the first, do the line segments $\overline{AB}$ and $\overline{BC}$ form an angle? In the second figure, do the line segments $\overline{AB}$ and $\overline{CD}$ form an angle? Justify your response to each question.

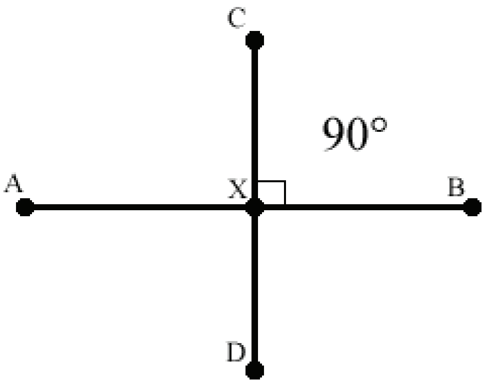


1. In the first figure, the line segments $\overline{AB}$ and $\overline{BC}$ meet the angle definition of two lines, rays, or line segments intersecting; the two segments form an angle.

2. In the second figure, the line segments $\overline{AB}$ and $\overline{CD}$ do not intersect, so they do not form an angle.

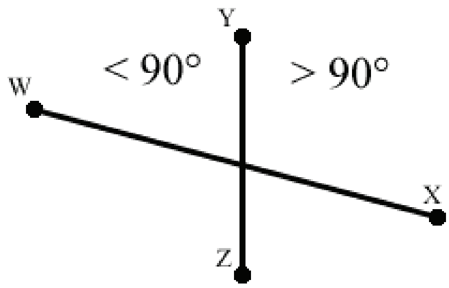
Example 3

By definition, $\overline{AB}$ is perpendicular to $\overline{CD}$ because $m\angle CXB$ is 90°. What are the measures of $\angle AXC$, $\angle AXD$, and $\angle DXB$?



1. The measures of $\angle AXC$, $\angle AXD$, and $\angle DXB$ are all 90°. The importance of the perpendicular relationship is that all four angles created by the intersection are equal.

2. In the figure that follows, we can see the result when the lines are not perpendicular: the angles of intersection are not equal.

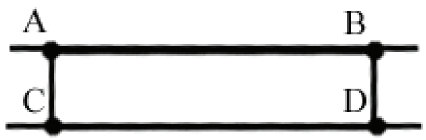


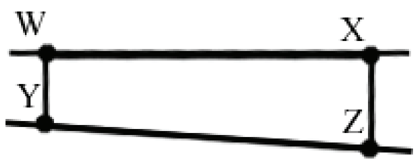
Example 4

Given the following:

$\overline{AC} \cong \overline{BD}$	$\overline{WY} < \overline{XZ}$
$\overline{AB} \perp \overline{AC}$	$\overline{WX} \perp \overline{WY}$
$\overline{AB} \perp \overline{BD}$	$\overline{WX} \perp \overline{XZ}$

Are $\overline{AB}$ and $\overline{CD}$ parallel? Are $\overline{WX}$ and $\overline{YZ}$ parallel? Explain.



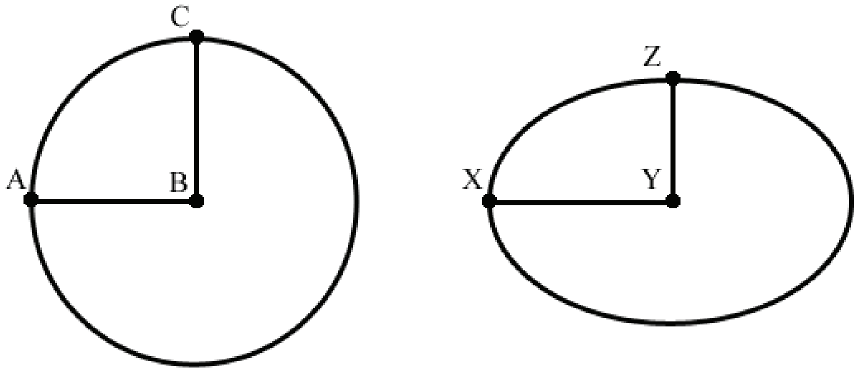


1. $\overline{AC}$ and $\overline{BD}$ intersect $\overline{AB}$ at the same angle and $\overline{AC} \cong \overline{BD}$. $\overleftrightarrow{AB}$ will never cross $\overleftrightarrow{CD}$. Therefore, $\overline{AB}$ is parallel to $\overline{CD}$.

2. $\overline{WY}$ and $\overline{XZ}$ intersect $\overline{WX}$ at the same angle, but $\overline{WY} < \overline{XZ}$. As you move from Z to Y on $\overleftrightarrow{YZ}$, you move closer to, and will eventually intersect, $\overleftrightarrow{WX}$. Therefore, $\overline{WX}$ is not parallel to $\overline{YZ}$.

Example 5

Refer to the figures below. Given $\overline{AB} \cong \overline{BC}$, is the set of points with center *B* a circle? Given $\overline{XY} > \overline{YZ}$, is the set of points with center *Y* a circle?



1. The set of points with center *B* is a circle because all points are equidistant from the center, *B*.

2. The set of points with center *Y* is not a circle because the points vary in distance from the center, *Y*.