9-3

Name _____ Date _____

Constructing Bisectors (pages 364–366)

When you **bisect** a geometric figure, you divide it into two congruent parts. A line segment is the **perpendicular bisector** of another line segment when it bisects the segment at a right angle. You can use a straightedge and a compass to bisect a line segment or an angle.

Constructing Bisectors	• From each end of a line segment, use the same compass setting to draw arcs above and below the line segment. Join the points where the arcs intersect to draw the perpendicular bisector of the segment. • From the vertex of an angle, draw an arc that intersects the sides of the angle. From these two points of intersection, draw equal arcs inside the angle. Join the points where the arcs intersect to the vertex to make a ray that bisects the angle.

EXAMPLES

A When you draw a ray to bisect an angle of 56°, what is the measure of each angle formed?

Bisect means to divide into two equal parts, so each angle is one half of 56°, or 28°.

B When you draw the ray that bisects a right angle, are the two angles that result supplementary or complementary?

Since the two angles total 90°, they are complementary.

Try These Together

1. Draw a rectangle that is *not* a square. Draw the two diagonals that connect the opposite corners. Do the diagonals appear to bisect each other?

HINT: For each diagonal, compare the lengths of the two parts formed by the point where the diagonals intersect.

2. Draw a rectangle that is *not* a square. Draw the two diagonals that connect the opposite corners. Is one diagonal the perpendicular bisector of the other?

HINT: Measure the angles formed where the diagonals intersect to see if they are 90°.

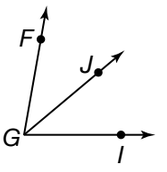
PRACTICE

Draw the angle or line segment with the given measurement. Then use a straightedge and a compass to bisect each angle or line segment.

3. 90° **4.** 4 cm **5.** 68° **6.** 3 in. **7.** 124°

8. **Standardized Test Practice** Angle FGI has been bisected by $\overrightarrow{GJ}$. If $m\angle FGI$ is 80°, what is the measure of each angle formed ($\angle FGJ$ and $\angle JGI$)?

A 60° **B** 30° **C** 50° **D** 40°



Answers: **1.** yes **2.** no **3–7.** See Answer Key. **8.** D