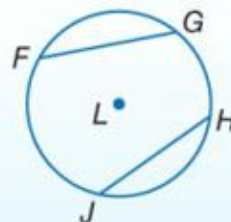


# 10.3 Arcs and Chords

Thm:

**Words** In the same circle or in congruent circles, two minor arcs are congruent if and only if their corresponding chords are congruent.

**Example**  $\overline{FG} \cong \overline{HJ}$  if and only if  $\widehat{FG} \cong \widehat{HJ}$ .



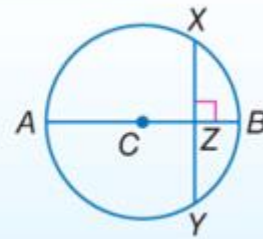
**Jewelry** A circular piece of jade is hung from a chain by two wires around the stone.

$\overline{JM} \cong \overline{KL}$  and  $m\widehat{KL} = 90$ . Find  $m\widehat{JM}$ .



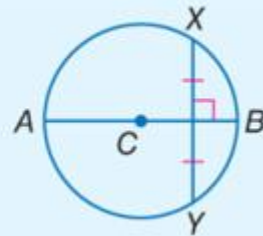
If a diameter (or radius) of a circle is perpendicular to a chord, then it bisects the chord and its arc.

**Example** If diameter  $\overline{AB}$  is perpendicular to chord  $\overline{XY}$ , then  $\widehat{XZ} \cong \widehat{ZY}$  and  $\widehat{XB} \cong \widehat{BY}$ .



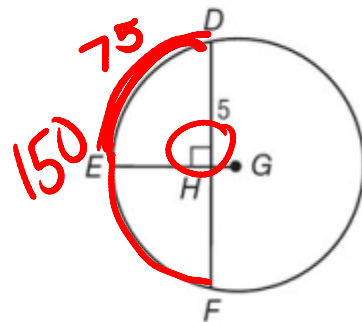
The perpendicular bisector of a chord is a diameter (or radius) of the circle.

**Example** If  $\overline{AB}$  is a perpendicular bisector of chord  $\overline{XY}$ , then  $\overline{AB}$  is a diameter of  $\odot C$ .



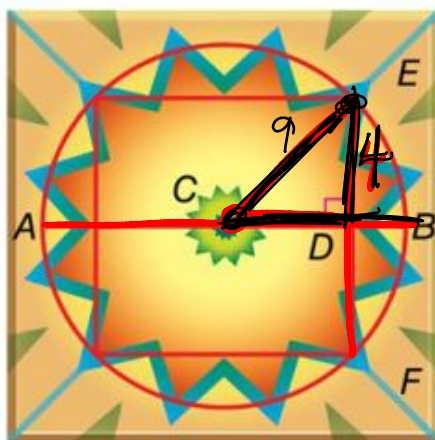
In  $\odot G$ ,  $m\widehat{DEF} = 150$ . Find  $m\widehat{DE}$ .

75



**CERAMIC TILE** In the ceramic stepping stone below, diameter  $\overline{AB}$  is 18 inches long and chord  $\overline{EF}$  is 8 inches long. Find  $CD$ .

$r = 9$



$$9^2 = 4^2 + x^2$$

$$81 = 16 + x^2$$

$$\begin{array}{r} -16 \\ \hline 65 = x^2 \end{array}$$

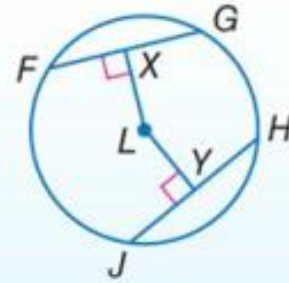
$$\sqrt{65} = x$$

$$8.06 = x$$

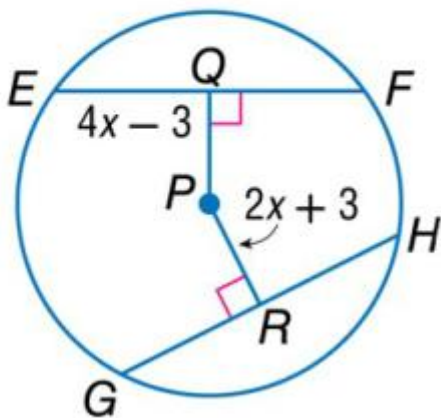
65  
^  
13 5

In the same circle or in congruent circles, two chords are congruent if and only if they are equidistant from the center.

$LX = LY$  if and only if  $\overline{FG} \cong \overline{JH}$ .



In  $\odot P$ ,  $EF = GH = 24$ . Find  $PQ$ .



$$4x - 3 = 2x + 3$$

$$\begin{array}{r} -2x \\ -24 \end{array}$$

$$2x - 3 = 3$$

$$\begin{array}{r} +3 \\ +3 \end{array}$$

$$\frac{2x}{2} = \frac{6}{2}$$

$$x = 3$$