Questions on Lesson 9.3?

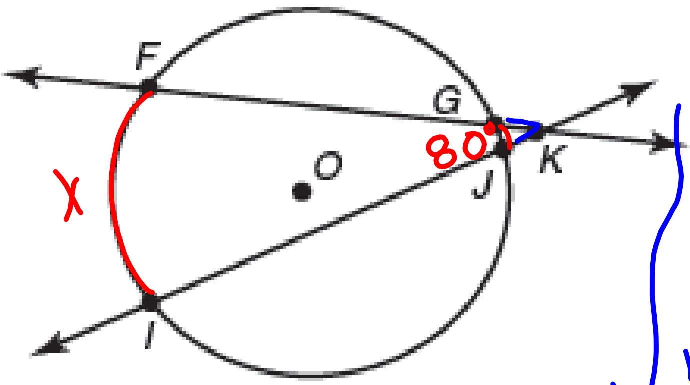
Answer these questions to help you review.

2 seconds

Determine $m\overset{\frown}{FI}$.

$m\angle K = 20°$

$m\overset{\frown}{GJ} = 80°$



$\angle K = \frac{1}{2}(m\overset{\frown}{FI} - m\overset{\frown}{GJ})$

$2 \cdot 20 = \cancel{2}\cancel{\frac{1}{2}}(x - 80)$

$40 = x - \cancel{80}$
$+80 \quad\quad +\cancel{80}$

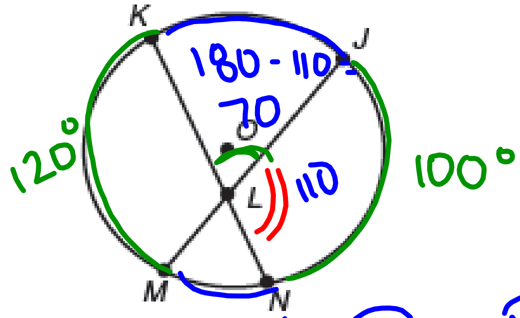
$120° = x$

$\boxed{m\overset{\frown}{FI} = 120°}$

Determine $m\angle KLJ$.

$m\overset{\frown}{KM} = 120°$

$m\overset{\frown}{JN} = 100°$



$m\angle KLJ = \frac{1}{2}(m\overset{\frown}{KJ} + m\overset{\frown}{MN})$

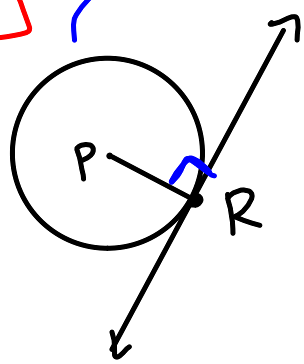
$m\angle JLN = \frac{1}{2}(m\overset{\frown}{JN} + m\overset{\frown}{KM})$

$m\angle JLN = \frac{1}{2}(100 + 120)$

$m\angle JLN = \frac{1}{2}(220)$

$m\angle JLN = 110°$

$\boxed{m\angle KLJ = 70°}$



Color Theory
Chords

9.4

pg.689 & 691 in your book

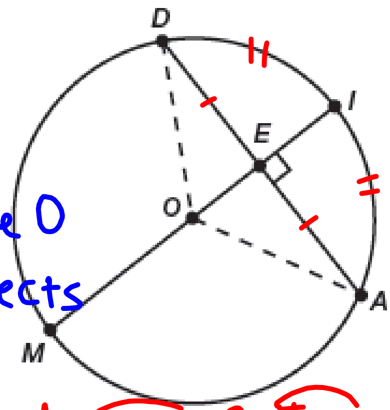
2. Prove the Diameter–Chord Conjecture.

Given: $\overline{MI}$ is a diameter of circle O.

$\overline{MI} \perp \overline{DA}$

Prove: $\overline{MI}$ bisects $\overline{DA}$.

$\overline{MI}$ bisects $\overset{\frown}{DA}$.



If $\overline{MI}$ is a diameter of circle O and $\overline{MI} \perp \overline{DA}$, then $\overline{MI}$ bisects $\overline{DA}$ and $\overline{MI}$ bisects $\overset{\frown}{DA}$.

BTW: $\overline{DE} \cong \overline{EA}$ and $\overset{\frown}{DI} \cong \overset{\frown}{IA}$

The **Diameter–Chord Theorem** states: "If a circle's diameter is perpendicular to a chord, then the diameter bisects the chord and bisects the arc determined by the chord."

pg.693 in your book

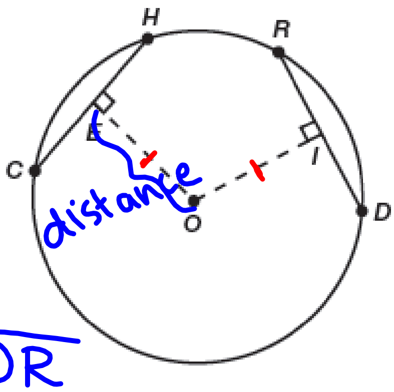
4. Prove the Equidistant Chord Conjecture.

Given: $\overline{CH} \cong \overline{DR}$

$\overline{OE} \perp \overline{CH}$

$\overline{OI} \perp \overline{DR}$

Prove: $\overline{CH}$ and $\overline{DR}$ are equidistant from the center point.



If $\overline{CH} \cong \overline{DR}$, $\overline{OE} \perp \overline{CH}$, and $\overline{OI} \perp \overline{DR}$, then $\overline{CH}$ and $\overline{DR}$ are equidistant from the center.

BTW: $\overline{OE} \cong \overline{OI}$

The **Equidistant Chord Theorem** states:
"If two chords of the same circle or congruent circles are congruent, then they are equidistant from the center of the circle."

pg.694 in your book

The **Equidistant Chord Converse Theorem** states: "If two chords of the same circle or congruent circles are equidistant from the center of the circle, then the chords are congruent."

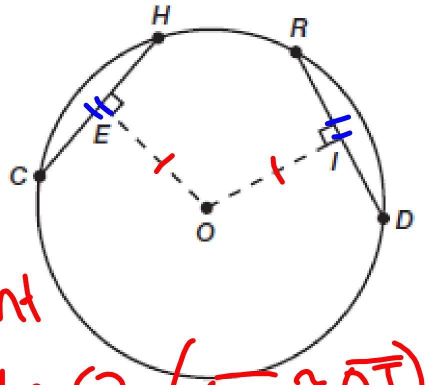
5. Prove the Equidistant Chord Converse Theorem.

Given: $OE = OI$ ($\overline{CH}$ and $\overline{DR}$ are equidistant from the center point.)

$\overline{OE} \perp \overline{CH}$

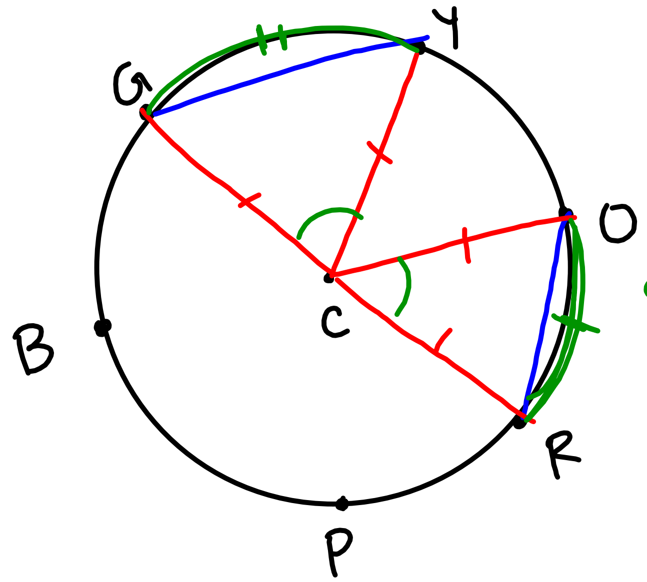
$\overline{OI} \perp \overline{DR}$

Prove: $\overline{CH} \cong \overline{DR}$



If $\overline{CH}$ and $\overline{DR}$ are equidistant from the center of circle O ($\overline{OE} \cong \overline{OI}$), then $\overline{CH} \cong \overline{DR}$.

p.696



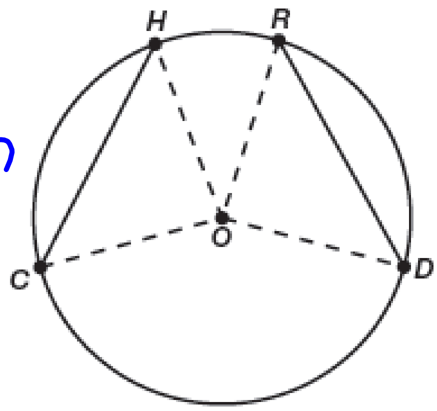
$\triangle GYC \cong \triangle OCR$
(SAS $\cong$)

So...
$\overset{\frown}{GY} \cong \overset{\frown}{OR}$

pg.697 in your book

2. Prove the Congruent Chord–Congruent Arc Theorem.

If $\overline{CH} \cong \overline{RD}$, then
$\overset{\frown}{CH} \cong \overset{\frown}{RD}$.



Given: $\overline{CH} \cong \overline{DR}$

Prove: $\overset{\frown}{CH} \cong \overset{\frown}{DR}$

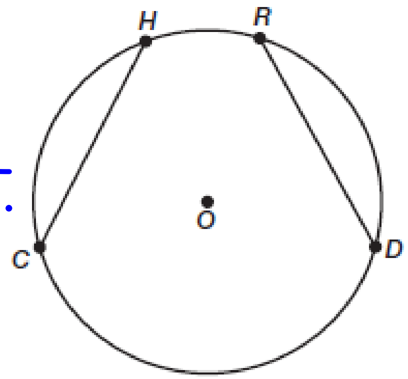
The **Congruent Chord–Congruent Arc Theorem** states: "If two chords of the same circle or congruent circles are congruent, then their corresponding arcs are congruent."

pg.698 in your book

The **Congruent Chord–Congruent Arc Converse Theorem** states: "If two arcs of the same circle or congruent circles are congruent, then their corresponding chords are congruent."

3. Prove the Congruent Chord–Congruent Arc Converse Theorem.

If $\overset{\frown}{CH} \cong \overset{\frown}{RD}$, then $\overline{CH} \cong \overline{RD}$.

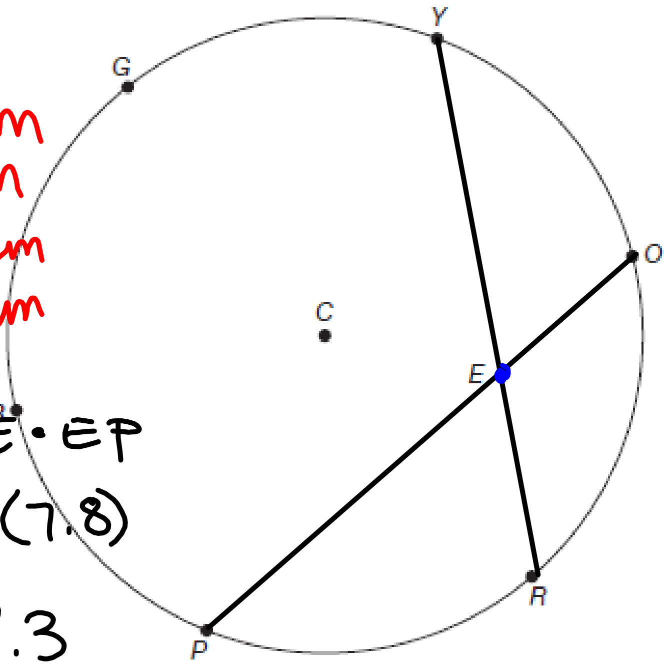


Given: $\overset{\frown}{CH} \cong \overset{\frown}{DR}$

Prove: $\overline{CH} \cong \overline{DR}$

Segments of a chord are the segments formed on a chord when two chords of a circle intersect.

1. Consider circle *C*.



$mYE = 6.6\text{cm}$
$mER = 4\text{ cm}$
$mOE = 3.5\text{cm}$
$mEP = 7.8\text{cm}$

$YE \cdot ER \approx OE \cdot EP$
$6.6(4) \approx 3.5(7.8)$
$26.4 \approx 27.3$

a. Draw two intersecting chords such that one chord connects two primary colors and the second chord connects to secondary colors.

b. Label the point at which the two chords intersect point *E*.

c. Use a ruler to measure the length of each segment on the two chords.

The product of the lengths of the segments on the first chord appears to be equal to the product of the lengths of the segments on the second chord.

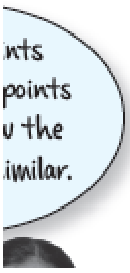
This observation can be proved and stated as a theorem.

pg.699 in your book

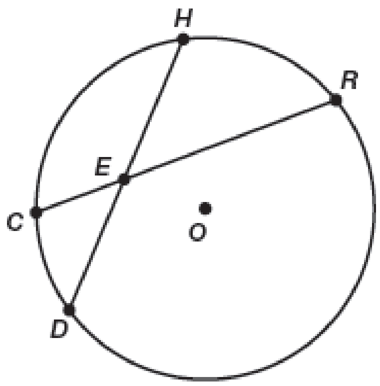
2. Prove the Segment-Chord Conjecture.

Given: Chords *HD* and *RC* intersect at point *E* in circle *O*.

Prove: $EH \cdot ED = ER \cdot EC$



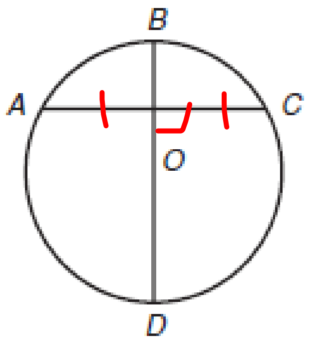
If $\overline{HD}$ & $\overline{RC}$ intersecting at E inside circle O, then $\overline{HE} \cdot \overline{ED} = \overline{CE} \cdot \overline{ER}$.



The **Segment–Chord Theorem** states that "if two chords in a circle intersect, then the product of the lengths of the segments of one chord is equal to the product of the lengths of the segments of the second chord."

NOT in your book

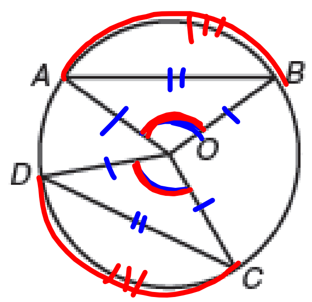
1. If diameter $\overline{BD}$ bisects $\overline{AC}$, what is the angle of intersection?



$90°$

chord-diameter thm.

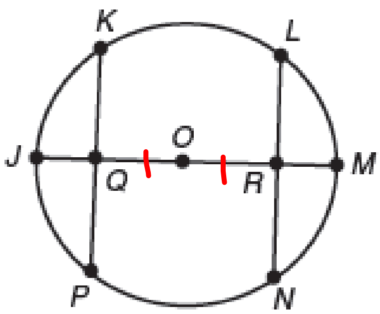
17. If $\angle AOB \cong \angle DOC$, what is the relationship between $\overline{AB}$ and $\overline{DC}$?



$\overline{AB} \cong \overline{DC}$

congruent chord-congruent arc converse thm.

4. If $\overline{KP} \cong \overline{LN}$, how does the length of $\overline{QO}$ compare to the length of $\overline{RO}$?

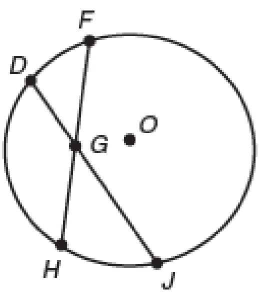


$\overline{QO} \cong \overline{RO}$

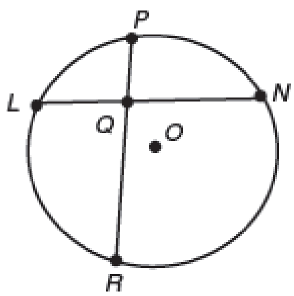
equidistant chord thm.

Use each diagram and the Segment Chord Theorem to write an equation involving the segments of the chords.

19.



20.



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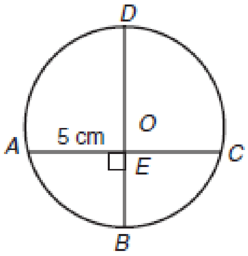
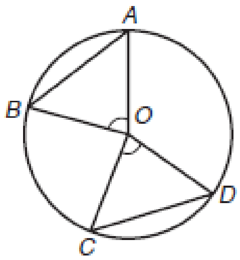
NOT in your book

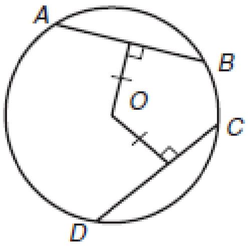
7. If $\overline{BD}$ is a diameter, what is the length of $\overline{EC}$?



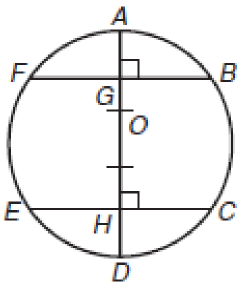
9. If the length of $\overline{AB}$ is 24 centimeters, what is the length of $\overline{CD}$?



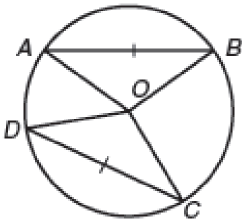
8. If the length of $\overline{AB}$ is 13 millimeters, what is the length of $\overline{CD}$?



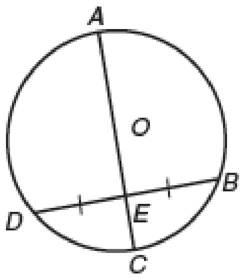
10. If the length of $\overline{BF}$ is 32 inches, what is the length of $\overline{CH}$?



11. If the measure of $\angle AOB = 155°$, what is the measure of $\angle DOC$?



12. If segment $\overline{AC}$ is a diameter, what is the measure of $\angle AED$?



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Homework

Finish Lesson 9.4