NOTES 10.3 – ARCS & CHORDS

CHORD: *A segment whose endpoints are on the circle.*

THEOREM: In a circle (or congruent circles), 2 minor arcs are congruent if and only if their corresponding chords are congruent.
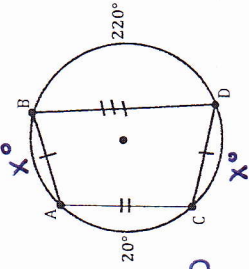
EXAMPLE 1: Use the figure to answer the questions below.
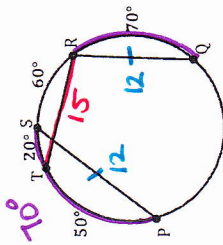

a) Which two chords are congruent? $\overline{AB}$ & $\overline{CD}$

b) What are the measures of their arcs? 60°

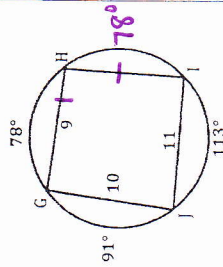$x + x + 220 + 20 = 360$
$x = 60$

EXAMPLE 2: If PS = 12 and TR = 15, then find QR.
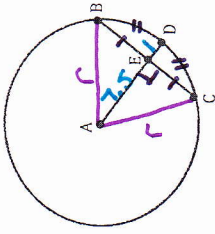

QR = 12

EXAMPLE 3: Find HI.

HI = 9

THEOREM: In a circle, if a diameter (or radius) is perpendicular to a chord, then it bisects the chord and its arc.

EXAMPLE 4: $\overline{AD} \perp \overline{BC}$, AE = 7.5, and the radius is 8.5. Find the following.

$leg^2 + leg^2 = hyp^2$
$7.5^2 + x^2 = 8.5^2$
$x^2 = 16$
$x = 4$

a) ED = 1
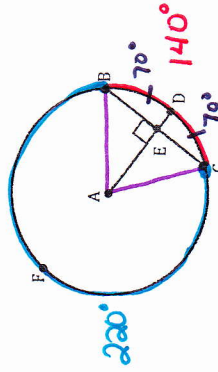b) AC = 8.5
c) AB = 8.5
d) EB = 4
e) EC = 4
f) BC = 8

EXAMPLE 5: If the measure of $\overarc{CFB} = 220°$, find the following.
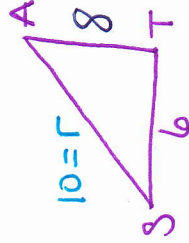

a) $m\,\overarc{CB} =$ 140°
b) $m\angle CAB =$ 140°
c) $m\angle BAD =$ 70°
d) $m\,\overarc{CD} =$ 70°
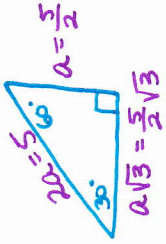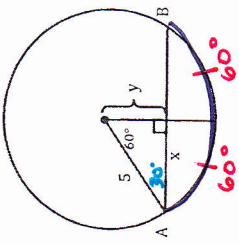
EXAMPLE 6: In *circle A*, SQ = 12 and AT = 8. Find AR. AR is a radius!

AR = 10

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Notes 10.3 – Arcs & Chords (Continued)

EXAMPLE 7: Using the diagram below, find the indicated values.

$x = \dfrac{5\sqrt{3}}{2}$

$y = \dfrac{5}{2}$

$m\overset{\frown}{AB} = 120°$

$2a = 5$, $a = \dfrac{5}{2}$, $a\sqrt{3} = \dfrac{5}{2}\sqrt{3}$

THEOREM: In a circle (or congruent circles), two chords are congruent if and only if they are equidistant from the center.
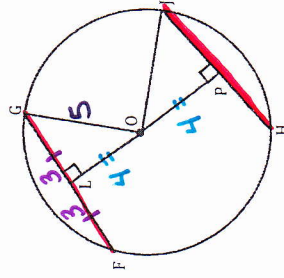
EXAMPLE 8: Find the values of 'x' and 'y'.
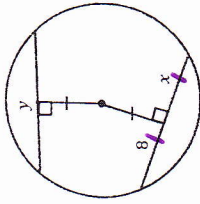
$x = 8$

$y = 16$

EXAMPLE 9: In *circle O*, FL = 3, GO = 5, and OP = 4. Find HJ.

HJ = 6

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